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TRANSPORTATION DEVELOPMENT CENTRE
Montreal, Quebec

Compendium of Transportation Equipment for Disabled Persons

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COMPENDIUM OF TRANSPORTATION EQUIPMENT FOR DISABLED PERSONS

- Wheelchair Lifts
- Wheelchair Securements
- Non-Conventional Wheelchairs
- Wheelchair Loaders

by

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and
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Acknowledgements

The Transportation Development Centre thanks the manufacturers and developers for their cooperation in providing the information contained herein.

Disclaimer

Every effort has been made to ensure that the product information presented in this compendium is accurate. Descriptions are based mainly on literature obtained from manufacturers and developers of equipment. Prospective consumers should contact the representatives of the manufacturers or developers directly for any additional information and the names of local suppliers. Inclusion of a product in this compendium does not reflect endorsement by Transport Canada.

Patent

The reader should be aware that some products have patents pending.

Prices

Prices have been listed where available. Prospective buyers should contact the manufacturer for any price changes.

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INTRODUCTION

This year, the International Year of Disabled Persons, public attention has focused on the issue of accessible transportation for the disabled. Among the myriad of problems associated with the provision of accessible transportation services is the acquisition of suitable equipment. In the first place, developers and manufacturers of specialized equipment are neither numerous nor well known to the public, and, secondly, the consumer is uninformed. Contributing factors are market uncertainty and fragmentation, high cost/risk, and lack of information.

Legislation of safety standards for equipment used in vehicles to transport disabled persons would create a guaranteed market for specialized equipment meeting the standards. A guaranteed market would also mitigate the cost/risk factor associated with the development and manufacture of new and improved products.

Lack of information is a problem for everyone involved in the field of transportation for disabled persons. Developers and manufacturers do not have full access to equipment testing results, and new concepts in design do not receive full exposure. Lack of information is of special concern to consumers who must compare and then select equipment best suited for their purposes, without a comprehensive data base upon which to draw.

This compendium has been prepared by the Transportation Development Centre of Transport Canada with the objective of providing a comprehensive source of detailed information on specialized equipment currently on the market or in the prototype stage. The data contained in the compendium has been collected and synthesized from a variety of sources in North America and abroad. Sources include equipment manufacturers and suppliers, researchers and developers, operators and planners of special transportation services, consumer groups, workshops, conferences and government agencies. Because wheelchairs present the most significant accessibility problem, emphasis has been placed on equipment designed to provide accessible transportation for the wheelchair user.

The compendium is organized in four main sections for easy reference:

- wheelchair lifts
- wheelchair securements
- non-conventional wheelchairs
- wheelchair loaders.

Each section features:

- description of the device or system
- summary table of equipment characteristics
- data sheets
- photographs or drawings.

Supplementary material supplied includes:

- list of manufacturers/developers
- manufacturer/equipment summary table
- glossary
- selected bibliography.

I WHEELCHAIR LIFTS

The judicious choice of a wheelchair lift system is the key to accessible transportation for the wheelchair user. Currently two basic types of wheelchair lift machinery are on the market:

- electro-mechanical or electro-hydraulic elevator platform
- hydraulic or electro-hydraulic steplift.

The platform lift typically unfolds from the side or rear door of a van or small bus. The raise/lower movement is powered and the fold/unfold operation is manual or powered. This type of lift is used for both personal and commercial transportation and is operated by the user or the driver/attendant. The rotary platform lift is generally smaller and lighter than the folding type, and is designed primarily for sliding door installation in the privately owned vehicle. It is operated by the user, who may also be the vehicle driver.

The steplift generally converts the steps of the main bus entrance into a platform that is raised and lowered hydraulically, independent of the platform formation mechanism. The various models of steplifts are used in standard transit buses and are operated by bus drivers from their stations.

Significant factors affecting choice are:

- type of vehicle
- type of transportation operation
- urban or rural locale
- type of wheelchair used
- strength and dexterity of user.

WHEELCHAIR LIFTS

MANUFACTURER	TYPE			OPERATION			CONTROL		POWER SYSTEM			APPLICATION			REMARKS
	CONVENTIONAL PLATFORM	ROTARY PLATFORM	STEPLIFT	MANUAL	SEMI-AUTOMATIC	AUTOMATIC	USER/ATTENDANT	ATTENDANT/DRIVER	ELECTRO-HYDRAULIC	ENGINE DRIVEN HYDRAULIC	ELECTRO-MECHANICAL	VAN/RV	SCHOOL/SMALL BUS	TRANSIT BUS	
1. ABC ENTERPRISES INC.		X				X	X				X	X			Sliding side door Only 91.4 cm (36") side clearance required
2. AMERICAN GOLDEN BOY SALES CORP.		X				X	X				X	X			Only 81.2 cm (32") side clearance required
3. APENER MASCHINENBAU UND FÖRDERANLAGEN (AMF)															Intercity bus application
HUBMATIK		X			X	X		X	X					X	Side or rear door
4. THE BRAUN CORPORTATION															
LIFT-A-WAY	X					X	X		X			X			Side or rear door
LIFTER	X				X		X		X			X			Side or rear door
5. C.N. UNWIN LIMITED															
QUIKLIFT				X				X				X			Portable, hydraulic elevating device
6. COACH & EQUIPMENT MANUFACTURING CORP.	X				X			X	X				X		
7. COLLINS INDUSTRIES, INC.															
SAF-T-LIFT	X					X			X			X	X		
8. CROW RIVER INDUSTRIES INC.															
VANGATER	X				X	X	X				X	X			Side or rear door
BUSGATER	X				X	X	X						X		Side or rear door RV/Motorhome application
9. DRIVE-MASTER CORPORATION															
SWINGER		X				X	X				X	X			Less than 91.4 cm (36") side clearance required
10. ELECTRO VAN LIFT INC.															Sliding/folding side or rear door
LIFT FOR ALL REASONS		X				X	X				X	X			Less than 91.4 cm (36") side clearance required

WHEELCHAIR LIFTS

MANUFACTURER	TYPE CONVENTIONAL PLATFORM	TYPE ROTARY PLATFORM	TYPE STEPLIFT	OPERATION MANUAL	OPERATION SEMI-AUTOMATIC	OPERATION AUTOMATIC	CONTROL USER/ATTENDANT	CONTROL ATTENDANT DRIVER	POWER SYSTEM ELECTRO-HYDRAULIC	POWER SYSTEM ENGINE DRIVEN HYDRAULIC	POWER SYSTEM ELECTRO-MECHANICAL	APPLICATION VAN/RV	APPLICATION SCHOOL SMALL BUS	APPLICATION TRANSIT BUS	REMARKS
11. ENVIRONMENTAL EQUIPMENT CORP.															
EEC			X			X		X	X					X	Operates with arc motion
12. FRED SCOTT & SONS															
TRANSLIFT	X				X			X	X			X			Side or rear door
13. HANDICAPS INC.															
SUPERLIFT	X				X		X				X	X			Side door
SUPERARM					X		X				X	X			No platform
14. LIFT-U-INC.															
LIFT-U-LIFT			X			X		X	X					X	Partial Steplift Operates with arc motion
15. MAC'S LIFT GATE CORP.	X				X			X			X	X	X		Outside rear bumper installation
16. MOBILITY DYNAMICS INC.															
MARK I VAN LIFT	X					X	X				X	X	X		Side or rear door
17. P & Q LIFTS, INC.		X				X	X				X	X			Sliding side door or swing rear door Forward or reverse swing Only 77.4 cm (30 1/2") side clearance required
18. PARA INDUSTRIES (1978) LTD.															
MARK II	X					X	X		X			X			Side or rear door Fits into van stepwell
MARK III	X					X	X		X			X			Side or rear door in vans with steps

WHEELCHAIR LIFTS

MANUFACTURER	TYPE			OPERATION			CONTROL		POWER SYSTEM			APPLICATION			REMARKS
	CONVENTIONAL PLATFORM	ROTARY PLATFORM	STEPLIFT	MANUAL	SEMI-AUTOMATIC	AUTOMATIC	USER/ ATTENDANT	ATTENDANT/ DRIVER	ELECTRO-HYDRAULIC	ENGINE DRIVEN HYDRAULIC	ELECTRO-MECHANICAL	VAN/RV	SCHOOL/SMALL BUS	TRANSIT BUS	
19. RATCLIFF TAIL LIFTS LTD.															
FOLDAWAY	X				X			X	X			X			Side or rear door
RVP 250	X				X			X	X				X		Bus/ambulance application
20. REB MANUFACTURING, INC.															
TWO-IN-ONE LIFT	X					X	X		X			X			
21. RICON SALES INC.	X					X	X				X	X			Side or rear door
22. SERVICES INDUSTRIELS SAVARIA ENR.															
SIS	X					X	X		X			X			
23. SKILLCRAFT INDUSTRIES, INC.	X				X	X	X		X			X			
24. TARGET INDUSTRIES INC. T-500	X				X	X	X		X			X			
25. TOTAL MOBILITY SYSTEMS & DESIGNS INC.															
SAFETY VAN LIFT - II		X			X	X	X		X			X			Sliding or fold-open door Less than 96.5 cm (38") side clearance
26. TRANSI-LIFT EQUIPMENT CORP.															
TRANSI-LIFT			X			X		X	X					X	Bi-fold or plug door
27. TRANSPORTATION DESIGN & TECHNOLOGY, INC (TDT)			X			X		X		X				X	Electro-hydraulic power source optional
28. VAPOR CORPORATION TRAVELIFT			X			X		X		X			X	X	Electro-hydraulic power source optional

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-mechanical rotary platform

OPERATION: Automatic

MANUFACTURER: ABC Enterprises Inc.
8905 Mentor Ave.
Mentor, OH
U.S.A. 44060
Tel: (216) 255-5211

REPRESENTATIVE: Robert E. Williams, Vice President

TRADE NAME:

MODEL: VL - 5

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): $2,150 (U.S.) plus shipping

DESCRIPTION:

This lift is an electro-mechanical rotary platform suitable for application to any Ford and Chevrolet van with sliding side door. The lift frame is attached to the post assembly, which contains the lifting mechanism. A hinge is attached for rotating action. The platform incorporates fixed side and automatic rear and front safety stops. The rear flap acts as a ramp, while the wider front flap retracts automatically. The horizontal part of the frame acts as a safety rail or grab bar. The stowed platform rests on the vehicle floor just inside the van's side door.

A motor-driven screw mechanism provides lift power. The vehicle battery supplies power.

Operating switches are located on the left side of the grab bar and in a keyed control box on the outside of the van.

OPERATION:

The user unlocks the control box on the outside of the van and activates a switch that opens the van door. A second switch rotates the lift out and a third switch lowers the platform to ground level. The user locks the control box and rolls onto the platform. Switches located on the grab bar are activated to raise the platform and swing it into the van. The user then manoeuvres off the platform and into the van.

When this lift system is used in school buses or paratransit vehicles, the driver or attendant operates it.

SPECIFICATIONS:	Platform dimensions: Capacity: 272.4 kg (600 lb) Weight: 66 kg (150 lb) Lift time: Lower time: Length of travel: 66 cm (26")
SAFETY FEATURES:	. equipped for manual operation in event of power failure . can be stopped in any position with fingertip control . design permits unrestricted view for driver . shuts off automatically when platform contacts an obstacle
WARRANTY:	. one year on materials and workmanship
REMARKS:	. user operated . only 91.4 cm (36") side clearance required . door is not completely blocked . no major vehicle modifications . meets V.A. specifications . model SBL-1 available for school bus application

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-mechanical rotary platform

OPERATION: Automatic

MANUFACTURER: American Golden Boy Sales Corp.
2556 S. Fairview St.
Santa Ana, CA
U.S.A. 92704
Tel: (714) 957-8581

REPRESENTATIVE: Chris Colle, President

TRADE NAME: Golden Boy

MODEL: Deluxe

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): $1,795 (U.S.)

DESCRIPTION:

This lift is an electro-mechanical rotary platform suitable for van application. The platform frame is attached with hinges to the post assembly, which houses the lifting and rotating mechanisms. The platform features a retractable side plate assembly with a fixed safety stop across the front and a safety stop that operates behind the left large wheel of the chair. The cross frame, constructed of round tubing, acts as a safety rail or grab bar. The stowed platform rests on the vehicle floor just inside the door.

An electric motor provides lift power to drive the lifting and rotating mechanisms.

Operating switches are located on the left side of the cross frame and in a control panel on the outside of the van.

OPERATION:

The user operates the automatic door-opening switch from the control panel on the outside of the van. A second switch swings the lift out and a third lowers the platform, which adjusts automatically to curb or ground level. After locking the control panel, the user rolls onto the platform, parallel with the van, and locks the chair wheels. The rear safety stop raises automatically. Two operating switches on the frame lift the platform and swing it into the van. The user manoeuvres off the platform and into the van. The safety stop lowers automatically when the lift settles to the van floor or to the ground.

SPECIFICATIONS:

Platform dimensions: 58.8 cm x 76.2 cm (22" x 30") plus
29.2 cm x 66 cm (11 ½" x 26)
retractable fold-down tray
Capacity: 227 kg (500 lb)
Weight: 54.4 kg (120 lb)
Lift time: 15 s
Lower time: 10 s
Length of travel:

SAFETY FEATURES:

- manual back-up crank and swing back-up lever in event of power failure
- safety stop

WARRANTY:

- one year on parts and labour

REMARKS:

- user operated
- van application
- less than 81.2 cm (32") side clearance required

EQUIPMENT:	WHEELCHAIR LIFT
TYPE:	Electro-hydraulic rotary platform
OPERATION:	i) Automatic ii) Semi-automatic
MANUFACTURER:	Apener Maschinenbau und Förderanlagen (AMF) Gustav Bruns GMBH & Co. KG 2913 Apen (OLDB) Federal Republic of Germany Tel: (0 49 82) 52 25/6 Telex 25 1112 amf d
REPRESENTATIVE:	
TRADE NAME:	"Hubmatik" Swivel Lift
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	

DESCRIPTION:

This lift is an electro-hydraulic rotary platform suitable for bus application, for side or rear door installation. The swivel platform is attached to the frame structure, which is connected by arms to the main supporting vertical column. The frame structure consists of a roller-guided sliding mechanism along with a direct-action hydraulic cylinder to provide the lifting operation. The aluminium platform is equipped with fixed side wheel stops and automatic front and rear safety flaps with treadlever locking devices. A collapsible side railing provides security. The lift is stowed in its swivelled-in neutral position with folded-up platform.

A single-action hydraulic cylinder provides lift power for the raising operation, while lowering is accomplished through valve-controlled gravity. The vehicle's electrical system drives the hydraulic pump. Swivelling action may be automatic or manual.

Attendant-operated controls are mounted on a box attached to a coiled expandable cord. Control of the lift from the driver's seat is optional.

OPERATION:

The driver opens the bus door, manually or automatically. The lift is activated to swivel out and lower to sidewalk level for boarding. Rear-mounted lifts allow safe boarding from the sidewalk. The wheelchair is raised to vehicle floor level, and rolls off the platform. The attendant stows the lift, automatically or manually.

SPECIFICATIONS:

Platform dimensions: 110 cm x 95 cm (43.3" x 37.4")
Capacity: 350 kg (770 lb)
Weight: 90 kg (198 lb); 78 kg (171.6 lb) if all aluminium
Lift time: about 10 s
Lower time: about 8 s (according to vehicle type)
Length of travel: 60 cm - 150 cm (23.6" x 59")

SAFETY FEATURES:

- wheel stops
- railing

WARRANTY:

REMARKS:

- bus driver operated
- intra/inter-city bus application
- no passenger seats need to be eliminated
- rear or side door installation

EQUIPMENT:	WHEELCHAIR LIFT
TYPE:	Electro-hydraulic platform
OPERATION:	i) Automatic ii) Semi-automatic
MANUFACTURER:	The Braun Corp. 1014 South Monticello Winamac, IN U.S.A. 46996 Tel: (219) 946-6157
REPRESENTATIVE:	Tom Bonnell
TRADE NAME:	i) Lift-A-Way ii) Lifter
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	i) $2,049 - $2,292 (U.S.) ii) $1,264 - $1,291 (U.S.)

DESCRIPTION:

This lift is an electro-hydraulic platform suitable for van application, for side or rear door installation. The platform is attached to a movable frame whose arms are constrained to slide within two rectangular tubes that are part of the main frame attached to the vehicle. The lift system is welded steel construction with an expanded metal platform. The platform incorporates fixed side safety stops and an automatic endgate that acts as a loading ramp and safety stop. The platform stows vertically just inside the van door.

A hydraulic cylinder and chain mechanism provide lift power. The vehicle's electrical system drives the hydraulic pump. The platform lowers by means of gravity.

The location of operating switches is variable, according to lift model and operator requirements.

OPERATION:

The lift operator opens the van door, manually or automatically, and activates a switch to unfold the platform of the automatic model. The platform of the semi-automatic model must be folded and unfolded manually. The lift is lowered to ground level for boarding by the up/down switch. After boarding, the automatic safety stop engages before the lift is raised to vehicle floor level. The lift is stowed when the wheelchair rolls off the platform into the van.

SPECIFICATIONS:

Platform dimensions: 76.2 cm wide x 111.7 cm long
(30" x 44")
Capacity: 340.5 kg (750 lb)
Weight: 118 kg (260 lb)
Lift time: 6 s
Lower time: 6 s
Length of travel: variable

SAFETY FEATURES:

- manual operation in event of power failure
- safety wheel stops

WARRANTY:

- one year on parts only

REMARKS:

- user or attendant operated
- van application
- side or rear door installation
- meets current U.S. specifications

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Portable folding hydraulic lift

OPERATION: Manual

MANUFACTURER: C.N. Unwin Limited
Lufton
Yeovil, Somerset,
England BA22 8SZ
Tel: YEOVIL (0935) 5359

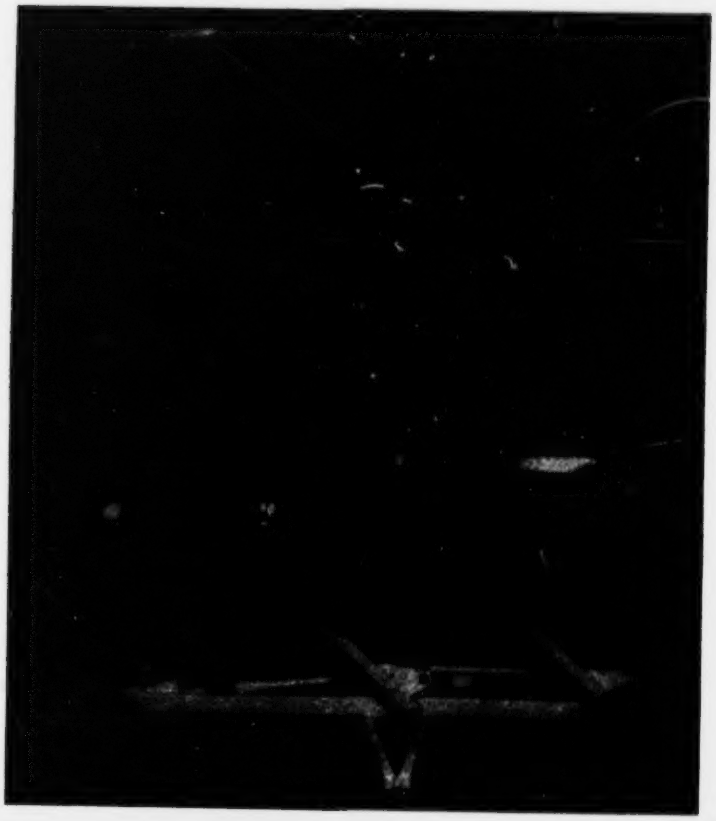
REPRESENTATIVE: C.N. Unwin, Director

TRADE NAME: Quiklift

MODEL:

PATENT NO.: Applied For

SUGGESTED RETAIL
PRICE (1981):



DESCRIPTION:

This lift is a manual, portable hydraulic wheelchair-elevating device. The system consists of two metal channels that form the elevating platform, each channel having hinged ramps to facilitate boarding and also act as safety gates. The platform is connected to the main frame by parallelogram linkages. The main frame is fitted with two small wheels, the pivoted stabilizer bars and the foot-operated hydraulic actuator, which is connected to the parallelogram linkages to lift the platform. The removable foot pedal is enclosed within the pivoted stabilizer bars when the system is stowed.

Lifting power is provided by a hydraulic cylinder and lowering is through gravity.

OPERATION:

The attendant removes the folded-up lift from the vehicle and manoeuvres it, on the two small wheels, into the desired position. The pivoted stabilizer bars are opened and the operating pedal is removed. The ramps are unfolded and the wheelchair is pushed onto the elevating platform. The operating pedal is inserted into the pumping mechanism. The attendant holds the wheelchair with both hands while pumping the foot pedal, which raises the platform to vehicle floor level. When the chair is rolled into the vehicle, the descent control lever, attached to the pump mechanism, is released to bring the lift back to ground level. The foot pedal is removed and stowed within the folded device.

SPECIFICATIONS:

Dimensions folded: 109 cm long x 33 cm wide x 28 cm high (43" x 13" x 11")
Dimensions unfolded: 109 cm long x 67 cm wide x 15 cm high (43" x 26 ½" x 6")
Weight: 24 kg (53 lb)
Lift of tracks from ground: 58.5 cm (23")
63.5 cm (25")

SAFETY FEATURES:

WARRANTY:

REMARKS:

- attendant operated
- not restricted to any one vehicle
- accommodates all wheelchairs
- customized units available

EQUIPMENT: **WHEELCHAIR LIFT**

TYPE: Electro-hydraulic platform

OPERATION: Semi-automatic

MANUFACTURER: Coach & Equipment Manufacturing Corp.
P.O. Box 36
Penn Yan, N.Y.
U.S.A. 14527
Tel: (315) 536-2321

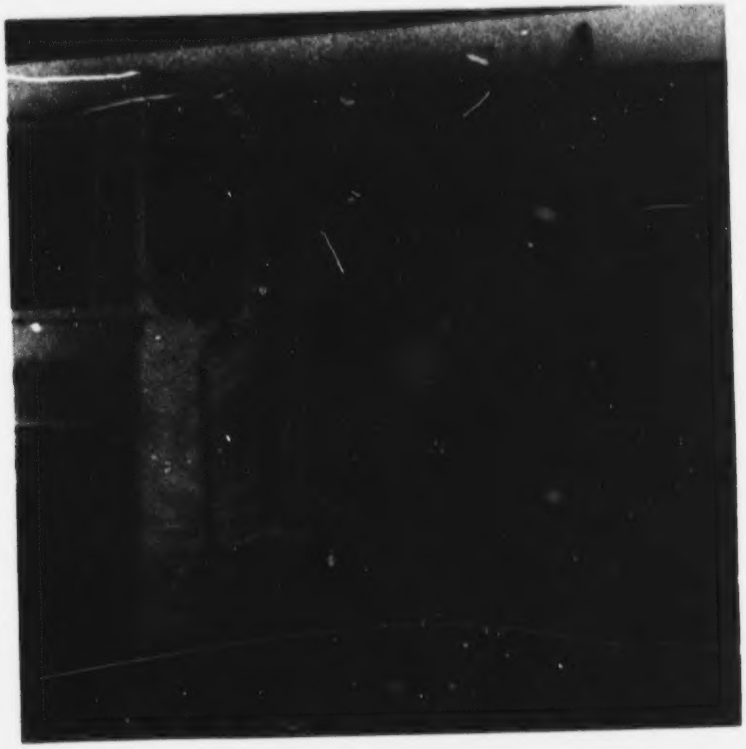
REPRESENTATIVE: William L. Shipman, Sales Representative

TRADE NAME: Series IV

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): $4,750 (U.S.) approx.



DESCRIPTION:

This lift is an electro-hydraulic platform suitable for small bus application. The lift is mounted inside the specially installed ""handicap'' double doors adjacent to the front door. This leaves the front entrance free for ambulatory passengers. The double doors are operable from the exterior of the vehicle. The platform is attached to two telescopic cylindrical guideways fixed to two posts inside the vehicle. In addition, two hydraulic cylinders are attached to the platform and to the tops of the posts parallel with the telescopic cylinders. When unfolded, the platform is held in the horizontal position by two diagonally placed chains.

The lift is steel construction, with an expanded metal platform equipped with a gravity-activated metal tip plate that acts as a boarding ramp at ground level and as a safety stpo, 10 cm (4") high, during lift operation. The lift stows vertically just inside the double doors.

Dual double-action hydraulic cylinders provide lifting power for the up/down mode. The vehicle's electrical system drives the hydraulic pump. The fold/unfold action is manual.

Attendant-operated controls for the up/down mode are mounted on a box attached to a cord that hooks onto the inside of the door.

OPERATION:

The bus driver opens the double doors from outside the vehicle and unfolds the lift platform. Activating the up/down switch lowers the platform to boarding level. When the wheelchair is in place and the safety barrier engaged, the platform is lifted to vehicle floor height. When the wheelchair rolls into the vehicle to a wheelchair station, the attendant folds the platform in vertical position and closes the double doors.

SPECIFICATIONS:

Platform dimensions: 85 cm wide x 111.7 cm long
(33.5" x 44")
Capacity: 340 kg (750 lb)
Weight:
Lift time:
Lower time:
Length of travel:

SAFETY FEATURES:

WARRANTY:

REMARKS:

- bus driver operated
- small bus application
- side door installation
- manual override optional
- power fold platform optional
- right hand grab rail optional
- pressure sensitive tape and valve optional

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-hydraulic platform

OPERATION: Automatic

MANUFACTURER: Collins Industries Inc.
P.O. Box 58
Hutchinson, KS
U.S.A. 67501
Tel: (316) 663-4441

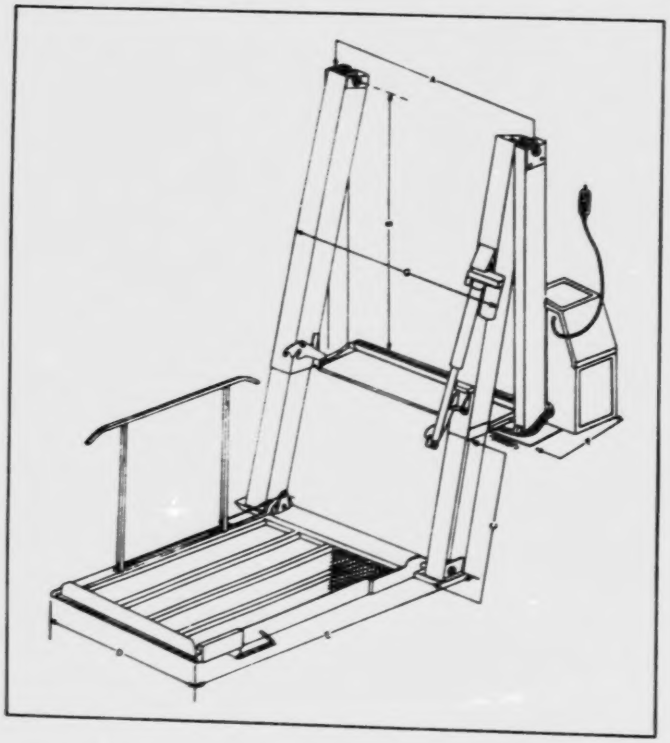
REPRESENTATIVE: William Hinze, Sales Manager
Special Products/O.E.M. Accounts

TRADE NAME: Saf-T-Lift

MODEL: W-22A; W-23A; W-27A; W-36A

PATENT NO.: 4,138,023 (U.S.)

SUGGESTED RETAIL PRICE (1981): $2,195 (U.S.) W-22A & W-27A
$2,495 (U.S.) W-23A & W-36A



DESCRIPTION:

This lift is an electro-hydraulic platform suitable for van, paratransit and school bus application. The platform is attached to a movable frame with arms constrained to slide within two rectangular tubes that are part of the main frame attached to the vehicle. There is no overhead bar. The lift system is welded steel construction with an expanded metal platform. The platform incorporates fixed side safety stops and an automatic 10 cm (4") high Saf-T-Stop at the outer end, which acts as a boarding ramp as well as a safety mechanism. A hinged bridge between the platform and the vehicle floor is standard equipment. An optimal Saf-T-Rail opens and closes automatically as the platform moves from vertical to horizontal position. The platform stows vertically inside the door, taking up 33 cm (13") of space.

Dual hydraulic cylinders, which are mounted on the right or left upward lift columns, provide lift power and operate the up/down mode. The vehicle's electrical system drives the hydraulic pump. The platform folds and unfolds automatically by electric power. The location of remote control switches, inside or outside the vehicle, is variable according to operator requirements.

OPERATION:

The operator opens the vehicle door and activates a switch to unfold the platform from vertical to horizontal position. Operating the up/down switch lowers the lift to ground or curb level for boarding. After boarding, the automatic safety stop engages and the platform is raised to vehicle floor level. The lift is stowed when the wheelchair rolls off the platform into the vehicle.

SPECIFICATIONS:

Platform dimensions: 67.3 - 82.5 cm wide x 109 - 113 cm long (26 ½" - 32 ½" x 43 - 44 ½")
Capacity: 340.5 kg (750 lb) working
Weight: 163.4 kg (360 lb)
Shipping weight: 181.6 kg (400 lb)
Lift time: 12 s
Lower time: 11 s
Length of travel: 83.8 cm - 109.2 cm (33" - 43")

SAFETY FEATURES:

- emergency platform release to manually lower platform to horizontal operating position
- down-pressure cut-off switch stops downward movement of platform
- safety slip clutch mechanism prevents platform from folding when load is more than 34 kg (75 lb)
- optional manual hand pump in event of power failure
- optional Saf-T-Rail, Saf-T-Sensor (bridge plate cut-off)

WARRANTY:

- one year on parts and workmanship

REMARKS:

- user or attendant operated
- customized van, paratransit, school bus application
- no overhead crossbar required
- fits doors of all U.S. buses and vans
- retrofit door kit available

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-mechanical platform

OPERATION: i) Automatic ii) Semi-automatic

MANUFACTURER:

Crow River Industries Inc.
1415 East Wayzata,
Wayzata, MN
U.S.A. 55391
Tel: (612) 475-2786

REPRESENTATIVE: Con Brown

TRADE NAME: Vangater

MODEL: Model 1976L (left) and 1976R (right)

PATENT NO.: 3,415,395 and 4,410,230 (U.S.)

SUGGESTED RETAIL PRICE (1981):

	Rear Door	Side Door
i)	$2,295	$2,155 (U.S.)
ii)	$1,835	$1,695 (U.S.)

DESCRIPTION:

This lift is an electro-mechanical platform suitable for van application. Installation may be left or right mount, in side or rear door. The platform is hinged to an L-shaped frame, which is pinned to two arms attached to the main post structure and forming the parallel linkages of the lifting mechanism. The lift system is tubular steel construction with an expanded metal, fold-in-half platform. The platform incorporates fixed side wheel stops and double actuated front safety stops, which also act as a boarding ramp. The fold-in-half platform, in vertical stowed position, leaves space for boarding of ambulatory persons.

An electric motor provides lift power that drives the ball screw and worm gear mechanism, which rotates the two arms of the lift mechanism to raise and lower the platform. Automatic folding and unfolding is executed through an electro-mechanical linear actuator operating on a lever and linkage system. The vehicle's electrical system drives the motor.

Operating switches may be located nearly anywhere on the van, according to operator requirement. An automatic door opener may be required to complete the control system.

OPERATION:

The operator opens the van door and activates a switch to unstow the platform of the automatic model into horizontal position. The platform of the semi-automatic model must be stowed and unstowed manually. Activating the up/down switch lowers the lift to ground level for boarding. After boarding, the wheel stops engage automatically as the platform is raised to vehicle floor level. When the wheelchair user has wheelchair rolled off the platform into the van, the platform is stowed.

SPECIFICATIONS:

Platform dimensions: 61.5 cm wide x 106.6 cm long (27" x 42") standard
Capacity: 522 kg (1150 lb)
Weight: 127 kg (280 lb)
Lift time: 10 s
Lower time: 8 s
Length of travel: 76 cm (30") or less, optional to 117 cm (46")

SAFETY FEATURES:

- safety wheel stops
- all moving parts enclosed
- auxiliary drive in event of power failure
- see-through, non-slip platform

WARRANTY:

- one year on parts and labour

REMARKS:

- user or attendant operated
- room for attendant on platform
- platform size optional
- van application
- side or rear door installation (left or right mount)
- meets V.A. requirements

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-mechanical platform

OPERATION: i) Automatic ii) Semi-automatic

MANUFACTURER:
Crow River Industries Inc.
1415 East Wayzata
Wayzata, MN
U.S.A. 55391
Tel: (612) 475-2786

REPRESENTATIVE: Con Brown

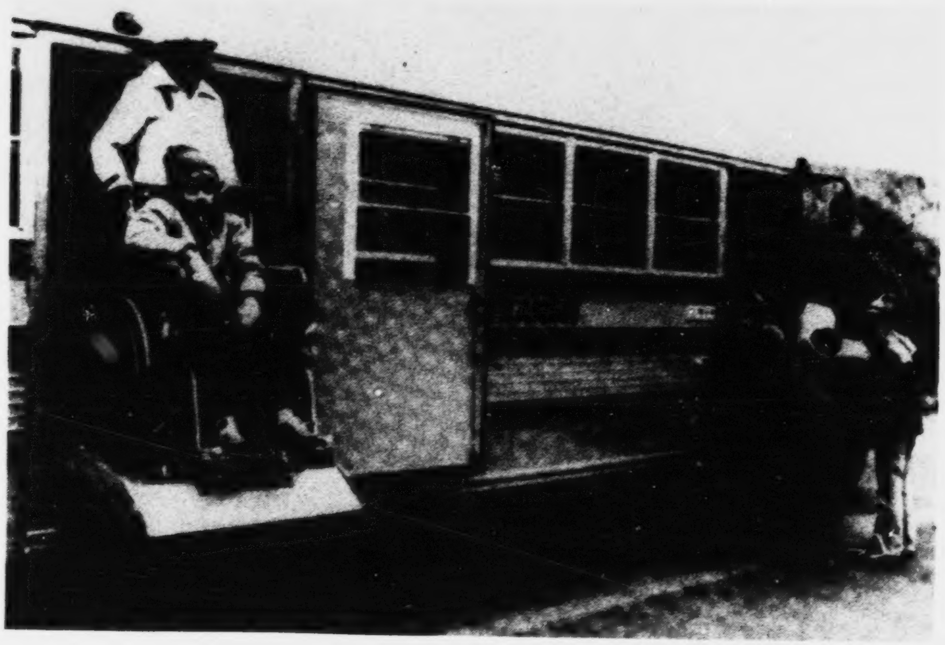
TRADE NAME: Busgater

MODEL: Model 2973L (left) and 2973R (right)

PATENT NO.: 3,415,395 and 4,140,230 (U.S.)

SUGGESTED RETAIL PRICE (1981):

	Rear Door	Side Door
i)	$2,825	$2,825 (U.S.)
ii)	$2,365	$2,365 (U.S.)



DESCRIPTION:

This lift is an electro-mechanical platform suitable for bus application. Installation may be left or right mount, in side or rear door. The platform is hinged to an L-shaped frame, which is pinned to two arms attached to the main post structure and forming the parallel linkages of the lifting mechanism. The lift system is tubular steel construction with an expanded metal platform. The platform incorporates fixed side wheel stops and double actuated front safety stops, which also act as a boarding ramp.

An electric motor provides lift power that drives the ball screw and worm gear mechanism, which rotates the two arms of the lift mechanism to raise and lower the platform. Automatic folding and unfolding is executed through an electro-mechanical linear actuator operating on a lever and linkage system. The vehicle's electrical system drives the motor.

Operating switches may be located nearly anywhere on the bus, according to operator requirements.

OPERATION:

The bus driver opens the bus door and activates a switch to unstow the platform of the automatic model into horizontal position. The platform of the semi-automatic model must be stowed and unstowed manually. Activating the up/down switch lowers the lift to ground level for boarding. After boarding, the wheel stops engage automatically and the platform is raised to vehicle floor level. When the wheelchair has rolled off the platform into the bus, the platform is stowed.

SPECIFICATIONS:

Platform dimensions: 76 cm wide x 106.6 cm long (30" x 42") standard
Capacity: 590 kg (1300 lb)
Weight: 145 kg (320 lb)
Lift time: 24 s
Lower time: 18 s
Length of travel: 101.6 cm (40") or less, optional to 117 cm (46")

SAFETY FEATURES:

. safety wheel stops
. all moving parts enclosed
. auxiliary drive in event of power failure
. see-through, non-slip platform

WARRANTY:

. one year on parts and labour

REMARKS:

. bus driver operated
. room for attendant on platform
. platform size optional
. motor home, RV or school bus application
. side or rear door installation (left or right mount)
. meets V.A. requirements
. model available for transit bus application

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-mechanical rotary platform

OPERATION: Automatic

MANUFACTURER: Drive-Master Corporation
16 Andrews Drive
West Paterson, N.J.
U.S.A. 07424
Tel: (201) 785-2204

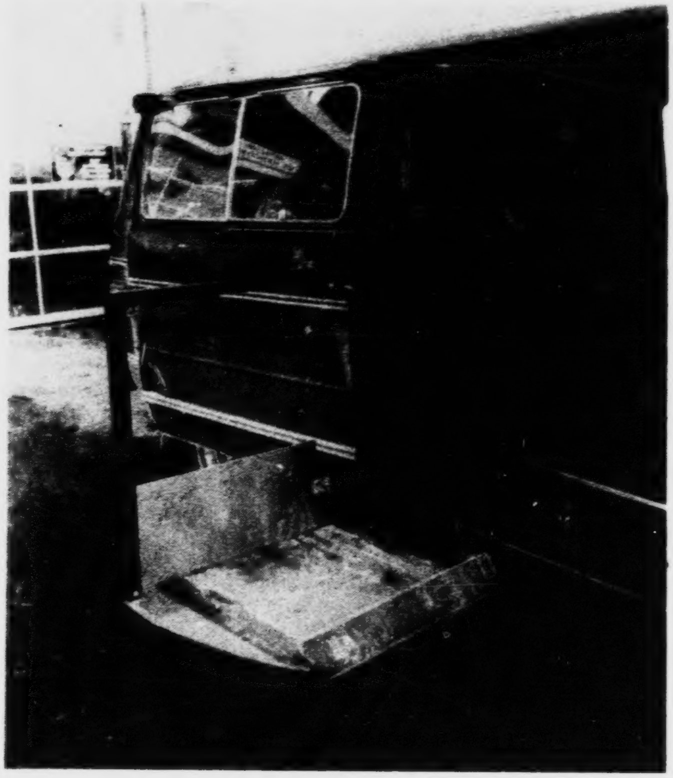
REPRESENTATIVE: Allan B. Ruprecht, President

TRADE NAME: Swinger

MODEL: V-1A

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): $2,045 (U.S.) installed



DESCRIPTION:

This lift is an electro-mechanical rotary platform suitable for van application. The platform frame is attached to the post assembly, which contains the lifting mechanism. The aluminium platform incorporates a folding front section and a rear flap that acts as a ramp as well as a safety stop. The horizontal part of the frame acts as a chest-high security rail. The stowed platform, with front portion upright, rests on the vehicle floor just inside the van door.

An electric-driven screw mechanism provides lift power. The vehicle battery supplies power.

Operating switches are located on the lift frame and in a locked control box outside the van.

OPERATION:

The user unlocks the control panel on the outside of the van and activates the first switch to open the vehicle door. The second switch activates the lift to swing out and the third lowers the platform to ground level. After locking the control panel, the user rolls forward onto the platform. The front portion of the platform lowers automatically to accommodate the front wheels of the wheelchair, while the ramp automatically folds upright to keep the chair from rolling backward. The horizontal part of the frame becomes a grab bar or security rail. Activating switches on the lift frame raise the platform and rotate it into the van. Once inside, the user manoeuvres off the platform and into the vehicle.

SPECIFICATIONS:

Platform dimensions: Flap down: 91.4 cm x 86.3 cm
(36" x 34")
Flap up: 61 cm x 86.3 cm
(24" x 34")
Capacity: 204 kg (450 lb)
Weight: 56.7 kg (125 lb)
Lift time: 15 s
Lower time: 18 s
Length of travel: 71 cm (28")

SAFETY FEATURES:

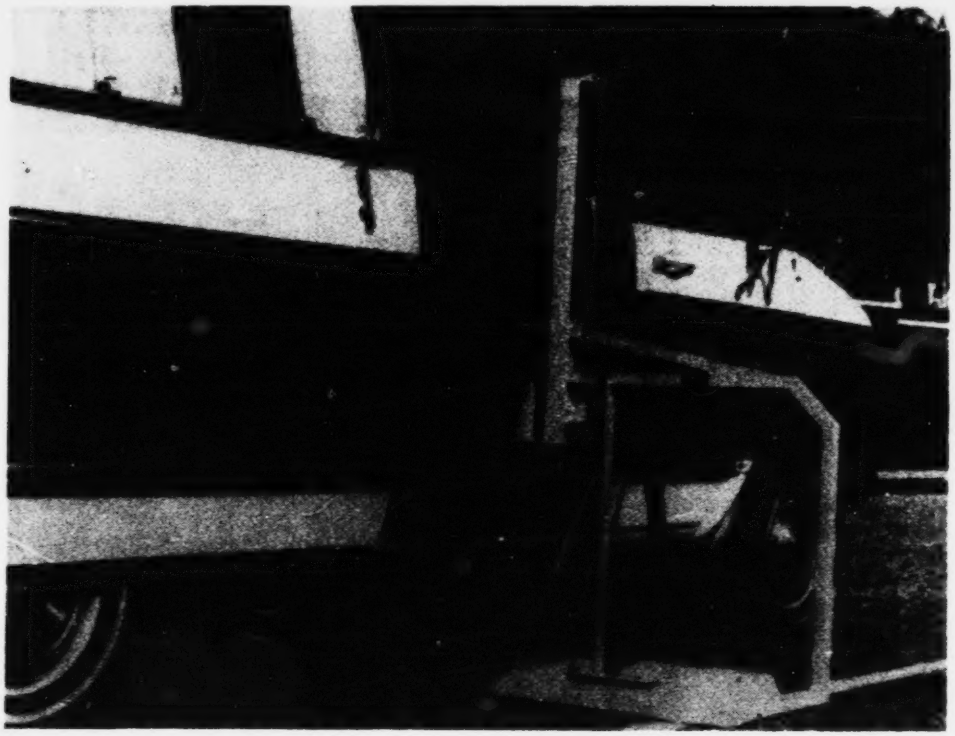
- manual operation in event of power failure
- lift cannot drop suddenly
- automatic platform safety stop

WARRANTY:

REMARKS:

- user operated
- van application
- less than 91 cm (36") side clearance required
- automatic and semi-automatic hydraulic folding lifts are available for side or rear mount

EQUIPMENT:	WHEELCHAIR LIFT
TYPE:	Electro-mechanical rotary platform
OPERATION:	Automatic
MANUFACTURER:	Electro Van Lift Inc. 140 Concord, Near Robert St. St. Paul, MN U.S.A. 55107 Tel: (612) 298-0721
REPRESENTATIVE:	Vern Warke, President
TRADE NAME:	Lift For All Reasons
MODEL:	i) EV-SC (sliding side door Chev. and GMC van) ii) EV-SD (sliding side door Dodge, Plymouth and Ford vans) iii) EV-F (folding side or rear door vans)
PATENT NO.:	
SUGGESTED RETAIL PRICE(1981):	i) $1,695 or $1,750 (U.S.) installed ii, iii) $1,895 or $1,950 (U.S.) installed



DESCRIPTION:

This lift is an electro-mechanical rotary platform suitable for van application, with sliding side, folding side, or folding rear door installation. The lift platform support arm is attached to the ball nut of the screw mechanism, which lifts and lowers the platform. A gear mechanism swings the platform in and out. The platform incorporates a 1/4" high lip, fixed side safety stops, and a safety flap, which is activated by a lever on the lift frame to lock behind the caster wheels of the chair. The horizontal part of the lift frame acts as a safety rail. The stowed platform rests on the floor inside the van door.

A floor-mounted electric motor that drives a linear ball screw mechanism provides lift power. The van battery supplies electric current.

Operating switches are located on the lift cross frame and in a keyed control panel outside the van. For attendant operation, controls may be mounted in other convenient locations.

OPERATION:

The user unlocks the control panel on the outside of the van and activates a switch to open the van door. A second switch swings the lift out and a third lowers it to ground level. The user rolls over the low lip onto the platform and flips the lever located on the cross frame to activate the chair lock. Operating switches on the frame lift the platform to vehicle floor level and swing it into the van. The user may then lower the chair lock and roll off the platform into the van.

SPECIFICATIONS:

Platform dimensions:
Capacity: 318 kg (700 lb)
Weight: 52 kg (115 lb)
Lift time: 10 s
Lower time: 10 s
Swing time: 8 s
Length of travel:

SAFETY FEATURES:

- manual operation to lower platform in event of power failure
- safety chair lock

WARRANTY:

REMARKS:

- user operated
- van application (1973 models and later)
- remote control to activate van door is available
- less than 91 cm (36") side clearance required
- conversion packages available for sliding door Chev, GMC, Dodge, Plymouth and Ford

EQUIPMENT:	**WHEELCHAIR LIFT**
TYPE:	Electro-hydraulic steplift
OPERATION:	Automatic
MANUFACTURER:	Environmental Equipment Corp. (EEC) 310 Preda Street San Leandro, CA U.S.A. 94577 Tel: (415) 568-1442
REPRESENTATIVE:	Kevin J. Adams, Vice President, Marketing and Sales
TRADE NAME:	EEC
MODEL:	140
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	

DESCRIPTION:

This lift is a hydraulic steplift suitable for transit bus application. The lift system is a self-contained modular unit designed for easy maintenance and retrofit. In stowed position the lift is the stair treads and risers of the bus front entrance. This configuration is transformed into a platform by means of parallelogram linkages. Platform formation is provided by two hydraulic cylinders under the bus steps. A second parallelogram linkage moves the platform from the bus floor. The first movement from floor level is upward and outward, over the apex and from there outward and downward in an arc. Because of the upward movement before descent, the lift does not drift downward when stowed. A level sensor keeps the platform truly level, rather than parallel with the bus floor. At ground level the lift assumes the slope of the ground to facilitate loading.

Another feature of the platform is a safety gate that also acts as a boarding ramp. The flight of stairs is maintained in stowed position without power.

Completely integrated hydraulic logic provides lift power. Lifting and lowering functions are accomplished through a hydraulic actuator. Deployment and stowing is through hydraulic cylinders.

A simple, clearly marked three-switch operation located near the driver provides lift controls.

OPERATION:

The bus driver operates the lift automatically from his seat.

SPECIFICATIONS:

Platform dimensions: 76 cm wide x 122 cm long (30" x 48")
Capacity: 454 kg (1000 lb)
Weight: 181.6 - 227 kg (400 - 500 lb)
Lift time: 17 - 20 s
Cycle time: 25 s
Length of travel:

SAFETY FEATURES:

- lift platform cannot fall or go to steps with passenger on lift
- manual override in event of power failure
- optional hand rail with seat
- automatic side, inboard and outboard barriers

WARRANTY:

REMARKS:

- bus driver operated
- transit bus application
- custom design available
- installation kits and accessories available

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-hydraulic platform

OPERATION: Semi-automatic

MANUFACTURER:
Fred Scott & Sons
1444 W. Rand Road
Des Plaines, IL
U.S.A. 60016
Tel: (312) 297-1603

REPRESENTATIVE: John H. Fowler

TRADE NAME: Translift

MODEL:
i) TLA (side door)
ii) TLAR (rear door)

PATENT NO.: 3,613,917 (U.S.)

SUGGESTED RETAIL PRICE (1981):
i) $1,380 (U.S.)
ii) $1,490 (U.S.)

DESCRIPTION:

This lift is an electro-hydraulic platform suitable for van application. Models are available for side or rear door installation. The platform is attached to two arms, which in turn are attached to sliding members on the vertical columns located in the van on either side of the door opening. The heavy gauge aluminium treadplate platform has fixed side safety stops. When deployed, the platform is held in the horizontal position by a diagonally placed metal strap, which is attached at one end to the side of the platform, and at the other end to the pivot point on the sliding member. The platform stows vertically in 20 cm (8") of space within the van.

A hydraulic cylinder and chain mechanism provides lift power. The vehicle's electrical system drives the hydraulic pump. Control switches are located to suit operator requirements.

OPERATION:

The lift operator opens the van door and rotates the platform and arm assembly 180°. The platform is then unfolded into horizontal position. A switch activates the platform to lower to ground level for passenger boarding. The platform is raised to vehicle floor level for the wheelchair to roll into the van. The platform is then lowered into position for manual storage.

SPECIFICATIONS:	Platform dimensions: 81 cm x 102 cm (32" x 40") Capacity: 250 kg (550 lb) Weight: 109 kg (240 lb) shipping Lift time: Lower time: Length of travel: 91 cm (36")
SAFETY FEATURES:	. platform can be held at desired height . wheel stop on front edge of platform is optional
WARRANTY:	
REMARKS:	. attendant operated . fits all rear- or side-loading vans

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-mechanical platform

OPERATION: Semi-automatic

MANUFACTURER:
Handicaps Inc.
4335 South Santa Fe Drive
Denver, CO
U.S.A. 80110
Tel: (303) 781-2062

REPRESENTATIVE: Geraldine O'Dell, Sales Manager

TRADE NAME: i) Superlift ii) Superarm

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):
i) $1,485 (U.S.) plus freight
$100 (U.S.) installation
ii) $1,500 (U.S.) plus freight
$100 (U.S.) installation

Superarm

DESCRIPTION:

i) This lift is an electro-mechanical platform suitable for side door van application. The platform is attached to a steel arm, which is electrically driven and connected to a vertical column located in the vehicle. A diagonal cable supports the platform in the horizontal position. The lift is steel construction with a treadplate aluminium platform. The platform incorporates fixed side wheel stops and a hinged portion that acts as a bridge plate. In vertical stowed position, with the bridge plate folded inside, the lift takes up 15.2 cm (6") of space inside the vehicle.

An electric motor driven by the vehicle's battery provides lift power.

Location of the control switch for the up/down operation is normally along the diagonal cable support for the platform; however, it may be located elsewhere according to operator requirements.

ii) This lift is an arm and pulley type mechanism suitable for side door van or motorhome installation. The system consists of a cantilevered horizontal bar attached to a gear-driven arm. The arm, pivoted from the lower end of a post structure, moves in a plane perpendicular to the longitudinal axis of the vehicle. The outward motion of the arm causes the lowering of the horizontal bar. An assembly of light nylon ropes, or chains, and adjustable rings is attached to the horizontal bar. Limit switches ensure that the lift will stop if the arm touches anything during descent. The lift will not operate when the vehicle doors are closed.

OPERATION:

i) The operator opens the van door and manually unfolds the platform from vertical to horizontal position. The lift is lowered for boarding by activating the up/down switch. When the wheelchair has boarded, the platform is activated by the up/down switch to lift it to vehicle floor level. Once the wheelchair is off the platform, the platform is pulled into a vertical stowed position and the van door closed.

ii) The operator opens the vehicle door and activates the switch, which causes the arm to pivot out. The centre of the rope assembly, which is attached to the wheelchair, has two rings that attach to the horizontal bar. The adjustable rings allow the chair to tip slightly backward to give head clearance while passing through the door. The control switch on the lift arm is activated to pick the chair up and swing it into the vehicle. Once in, the assembly is detached from the chair. The arm remains in upright position inside the door.

SPECIFICATIONS:

Platform dimensions: 73.6 cm x 132 cm (29" x 52")
Superlift
Capacity: one wheelchair
Weight: 159 kg - 181.6 kg (350 - 400 lb)
Lift time: a few seconds
Lower time: a few seconds
Length of travel: 71 cm (28") Superlift

SAFETY FEATURES:

- can be stopped in any position

WARRANTY:

- one year on parts

REMARKS:

i)
- user or attendant operated
- van application
- side door installation

ii)
- user or attendant operated
- van and motorhome application
- side door installation
- no platform - takes up little space

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-hydraulic partial steplift

OPERATION: Automatic

MANUFACTURER:
Lift-U-Inc.
402 Third & Lenora Building
2112 Third Avenue
Seattle, WA
U.S.A. 98121
Tel: (206) 624-5556

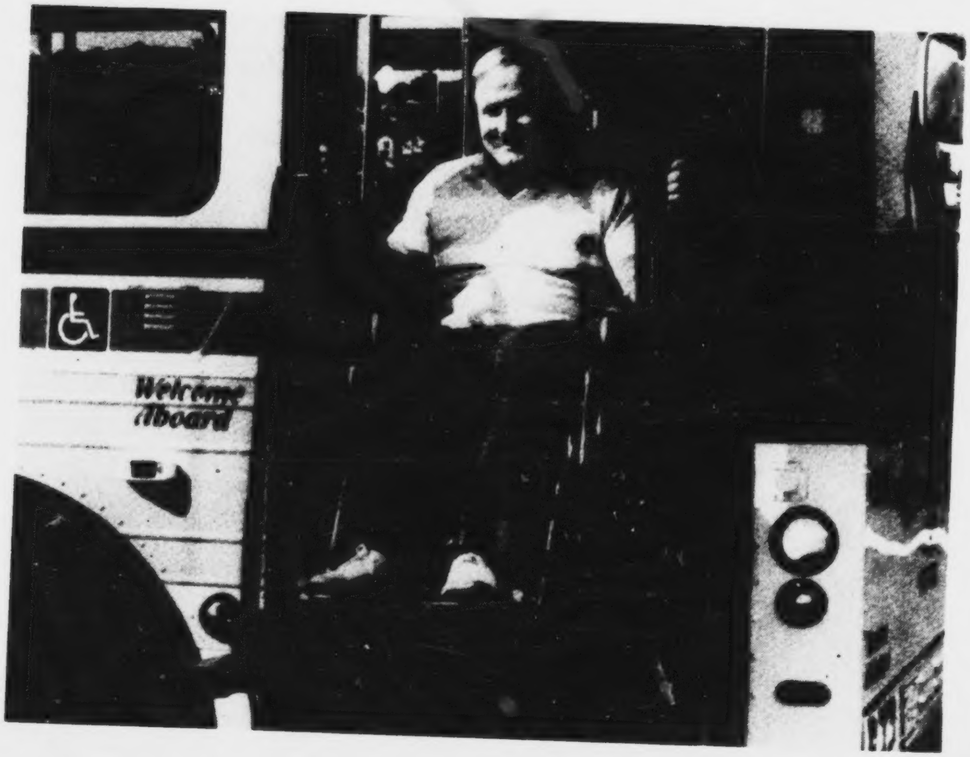
REPRESENTATIVE: Edwin O. Riddell, Vice President

TRADE NAME: Lift-U-Lift

MODEL: Mark II

PATENT NO.: 4,058,228 (U.S.) 273,100 (Cdn.)

SUGGESTED RETAIL PRICE (1981): Quotations given for specific installations



DESCRIPTION:

This is an electro-hydraulic partial steplift suitable for transit bus application. The lift unit is contained in a thin package, which extends almost the width of the bus, under the front entrance. The lift platform stows intact with the front portion becoming the bottom step of the bus entrance. To become operational, the one-piece platform is extended outward between two channels. The platform can then be raised or lowered by the action of the hydraulic cylinders on the four side arms, which constitute a pair of parallelogram linkages. The lift locks mechanically in stowed position to prevent outward drift. Downward drift is prevented by wedge-shaped tabs on the front corners of the platform that engage the channels when the platform is retracted. Handrails, which travel with the platform, are permanently mounted on that portion of the platform forming the bottom step. They become the regular passenger handrails when the lift is in stowed position. An automatic 28 cm (11") platform flap acts as a 8° angle boarding ramp and also as a safety gate to prevent the chair from rolling off. The gate stows horizontally with the platform.

Lift power, which is hydraulic, may be provided by the bus power steering system, a motor-driven pump on the power take-off unit at the engine, or a completely self-contained electro-hydraulic power-pac independent of the bus systems.

Electrical lift controls with three functions are located near the driver. The power on/off switch is located to the driver's left. The up/down and two stow switches are on the dashboard.

OPERATION:

The lift system is operated from the driver's seat. The bus driver activates the master switch to lock the brake and accelerator and energize the lift controls. Activating the up/down control deploys the lift and lowers the platform to curb level where the boarding ramp automatically lowers. The wheelchair boards and the safety gate engages when the driver activates the up/down switch to raise the platform to vehicle floor level. When the wheelchair leaves the platform, the driver stows the lift so that the steps are in normal configuration.

SPECIFICATIONS:

Platform dimensions: 91 cm wide x 151 cm long
(35 3/4" x 59 1/2")
Capacity: 454 kg (1,000 lb)
Weight: 227 kg (500 lb)
Lift time: adjustable (5-15 s)
Lower time: adjustable (5-15 s)
Length of travel: 114.3 cm (45")

SAFETY FEATURES:

- automatic safety gate
- permanent hand rails
- interlock control
- stops during cycle if pressure on control button is released
- manual operation in event of power failure

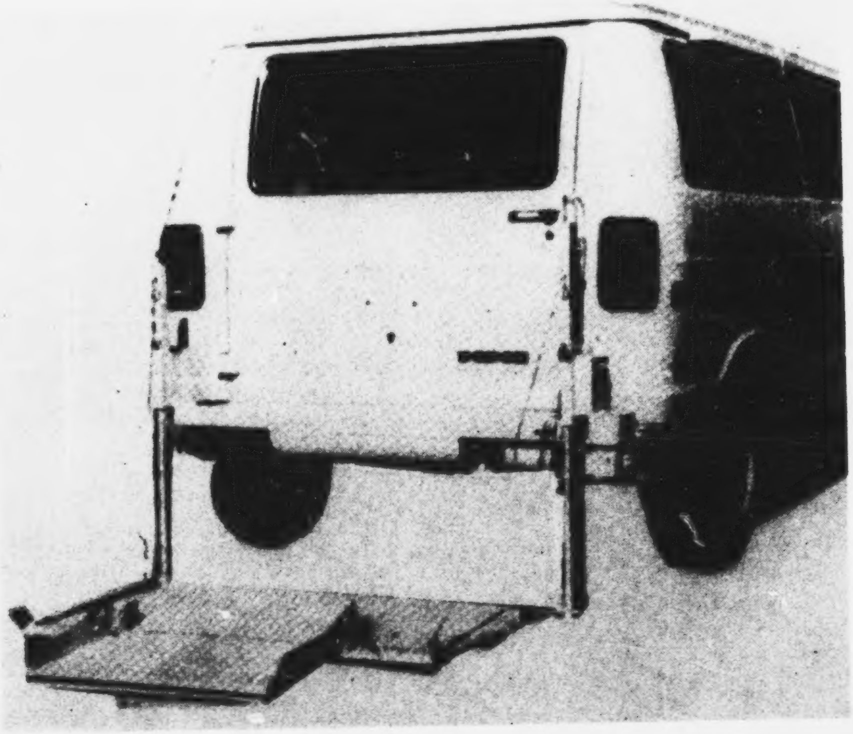
WARRANTY:

- one year on parts and labour

REMARKS:

- bus driver operated
- transit bus application
- certified to meet California Highway Patrol regulations
- custom-designed models available

EQUIPMENT:	WHEELCHAIR LIFT
TYPE:	Electro-mechanical platform
OPERATION:	Semi-automatic
MANUFACTURER:	Mac's Lift Gate Corporation 2727 South Street Long Beach, CA U.S.A. 90805 Tel: (213) 634-5962
REPRESENTATIVE:	Jerry MacDonald
TRADE NAME:	
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	$1,100 (U.S.) plus $150 (U.S.) installation



DESCRIPTION:

This lift is an electro-mechanical platform designed specifically for external installation on the rear of Ford, Dodge and Chevy vans. The platform pivots on two vertical lifting arms attached to the lifting mechanisms, which, in turn, are bolted to the lower structure of the vehicle on either side of the rear door opening. When unfolded, the platform is held in horizontal position by a diagonal cable attached to the front corner of the platform and the top of one of the lifting arms. The expanded metal platform incorporates a folding extension, which acts as a ramp, and a built-in safety stop mechanism. The extension provides room for an attendant to ride with the wheelchair. The lift stows vertically on the outside rear of the van, below the rear windows.

An electrically driven gear mechanism provides lifting power, raising or lowering the vertical columns to which the platform is attached. Folding and unfolding is manual.

A control button, located outside the van, is pushed to lower the platform for boarding. Remote control raises or lowers the loaded platform.

OPERATION:

The attendant unlocks the lift system and releases the latch, which allows the platform to unfold. The platform extension is unfolded and the control button pushed to lower the platform to boarding level. The van door is opened manually. When the wheelchair passenger has boarded the platform, a remote control switch activates the platform to rise to vehicle floor level. When the wheelchair has rolled into the vehicle, the attendant manually stows the lift.

SPECIFICATIONS:

Platform dimensions: overall 140 cm wide (55")
extension 76 cm wide x 114 cm long (30" x 45")
Capacity: 318 kg (700 lb)
Weight:
Lift time:
Lower time:
Length of travel:

SAFETY FEATURES:

- emergency crank in event of power failure
- platform large enough to accommodate attendant

WARRANTY:

- one year on parts

REMARKS:

- attendant operated
- Chev, Ford, and Dodge van and school bus application
- outside rear bumper installation

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-mechanical platform

OPERATION: Automatic

MANUFACTURER: Mobility Dynamics Inc.
21029 Itasca Ave.
Chatsworth, CA
U.S.A. 91311
Tel: (213) 998-1026

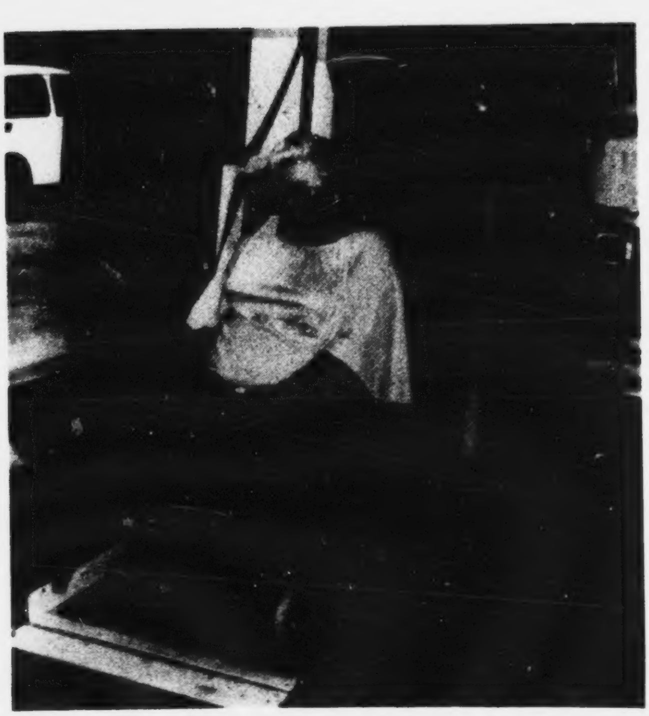
REPRESENTATIVE:

TRADE NAME: Mark I Van Lift

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):



DESCRIPTION:

This lift is an electro-mechanical platform suitable for rear or side door installation in vans, buses and mobile homes. The platform is pinned to two vertical arms that are part of the parallel bar linkage system, which connects the arms to the vertical columns of the main frame. The two nylon straps, which form a connection between the front of the platform and the top of the arms, maintain the platform in horizontal position. The platform, a portion of which is constructed of see-through lexan, incorporates fixed side safety stops and an automatic hinged front wheel stop, which also acts as a boarding ramp. The lift folds to stow vettically just inside the door.

An electrically powered, gear-driven sprocket and chain mechanism provides lift power. The vehicle's battery supplies power.

The location of operating switches is variable, according to operator requirements. Remote controls are available.

OPERATIONS:

The lift operator opens the vehicle door and activates a switch to unfold the platform from vertical to horizontal position. Operating the up/down switch lowers the lift to ground level for boarding. After boarding, the automatic safety stop engages and the platform is raised to vehicle floor level. The lift is automatically folded and stowed in vertical position after the wheelchair has rolled off the platform into the vehicle.

SPECIFICATIONS:

Platform dimensions: 66 cm or 76 cm wide (26" or 30")
Capacity: 341 kg (750 lb)
Weight:
Lift time:
Lower time:
Length of travel:

SAFETY FEATURES:

- automatic wheel stop
- nylon straps for lateral security
- electronic brake stops lift precisely
- safety interlock

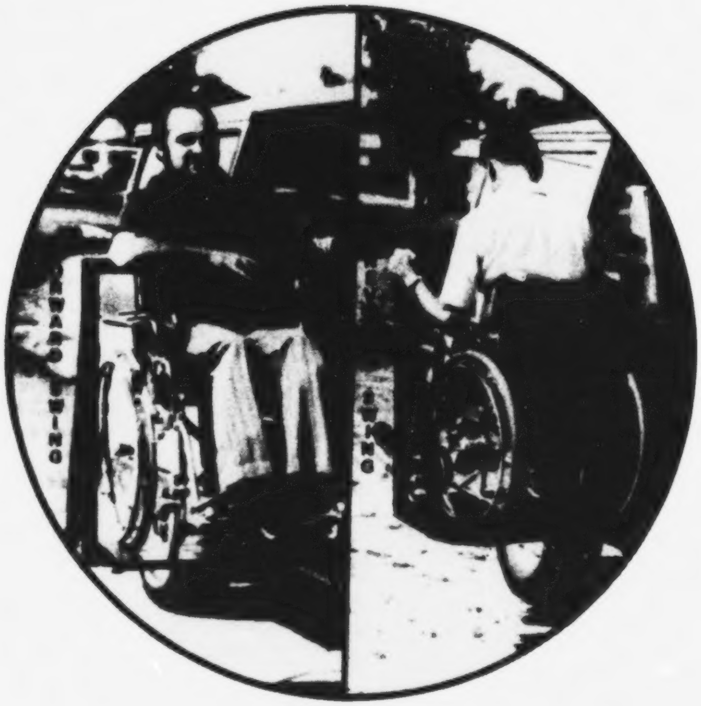
WARRANTY:

- full

REMARKS:

- user or attendant operated
- van, bus and mobile home application
- side or rear door installation
- remote control available
- V.A. approved

EQUIPMENT:	WHEELCHAIR LIFT
TYPE:	Electro-mechanical rotary platform
OPERATION:	Automatic
MANUFACTURER:	P & Q Lifts, Inc. 4457 - 63 CIR. No. Pinellas Park, FL U.S.A. 33565 Tel: (813) 522-9024
REPRESENTATIVE:	Phil Faas, (813) 898-8572
TRADE NAME:	P & Q Lifts, Inc.
MODEL:	GMF
PATENT NO.:	Pending
SUGGESTED RETAIL PRICE (1981):	$1,800 (U.S.)



DESCRIPTION:

This lift is an electro-mechanical rotary platform suitable for van application with sliding side door or swing rear door installation. The platform frame is attached to the fully enclosed power unit. The small, self-levelling platform features a space-conserving, sliding plate, which has a fixed front safety stop. The horizontal part of the frame acts as a security rail. The stowed platform rests on the vehicle floor just inside the door.

An electric motor provides lift power to drive a screw rod mechanism. The vehicle battery supplies power.

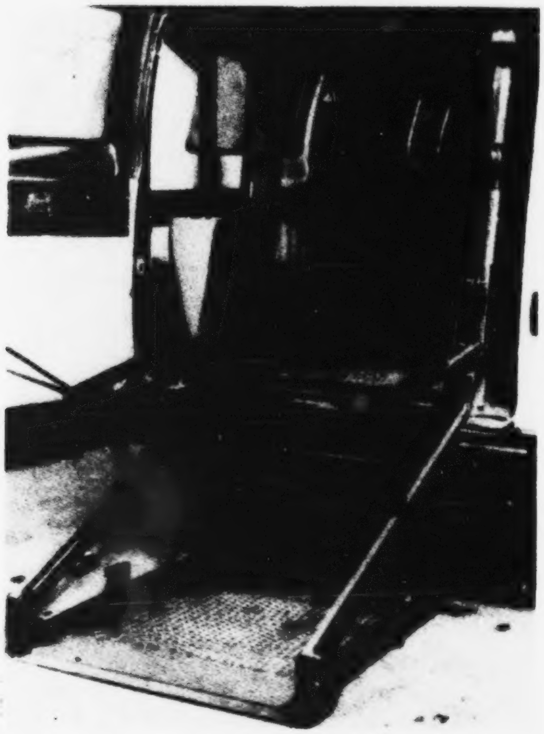
Control switches are located on the lift frame and in a control panel located to suit the user.

OPERATION:

The user either opens the van door manually or activates a control switch on the outside of the van to open the door. A second switch swings the lift out while a third lowers the platform to ground level. The user rolls onto the platform and activates the control switches on the frame to raise the platform and swing into the van. Once inside, the user manoeuvres off the platform and into the van.

SPECIFICATIONS:	Platform dimensions: 61 cm x 81 cm (24" x 32") Capacity: one wheelchair Weight: 56.7 kg (125 lb) Lift time: 15 s Lower time: 10 s Length of travel: 72.3 cm (28 1/2")
SAFETY FEATURES:	. hand crank for emergency . fully enclosed drive shaft
WARRANTY:	. one year on mechanical parts and workmanship . ninety days on electrical parts
REMARKS:	. user operated . van application . forward or reverse swing installation . semi-automatic model available . complete van conversions carried out . 77.4 cm (30 1/2") side clearance required

EQUIPMENT:	WHEELCHAIR LIFT
TYPE:	Electro-hydraulic platform
OPERATION:	Automatic
MANUFACTURER:	Para Industries (1978) Ltd. 74 Jamie St. Nepean, Ontario Canada K2E 6T6 Tel: (613) 226-5506
REPRESENTATIVE:	Bob Moran
TRADE NAME:	Mark II; Mark III
MODEL:	Mark II; Mark III
PATENT NO.:	1,008,817 (1977, Cdn.) 3,984,014 (1976, U.S.)
SUGGESTED RETAIL PRICE (1981):	



DESCRIPTION:

This lift is an electro-hydraulic platform suitable for side or rear door van installation. The lift platform has two brackets, on either side of the front edge, to which the parallel bar linkages are attached. The lifting chains also support the platform, passing through pulleys located on the side structure/fixed wheel stops, toward the back of the platform. The U-shaped main frame, to which the parallel bar linkages are attached, contains a hydraulic cylinder, pulley and one end of the chain in each arm. Folding handrails on each side of the platform are linked to the top parallel bar and to the main structure.

The expanded metal platform 0.6 cm (1/4") thick incorporates fixed side wheel stops and an automatic end safety flap, which also acts as a boarding ramp. The platform stows automatically in vertical position just inside the vehicle door. The Mark II lift has a projection that fits into the van stepwell, while the Mark III is installed in vans with steps.

Dual hydraulic cylinders, which, when extended, shorten the chains and lift the platform, provide lift power. The vehicle's electrical system drives the hydraulic pump. The electric motor and hydraulic pump are in a modular unit mounted on one side of the main frame.

Two activator switches are provided. The activator switch on the handrail controls the up/down action and the one located inside or outside the van folds and unfolds the platform and opens and closes the door.

OPERATION:

A touch of the first activator switch automatically opens the vehicle door and unfolds the lift platform level with the vehicle floor. A second activator switch, located on the handrail (or elsewhere), causes the lift to lower to ground level for boarding. Once the wheelchair is on the platform, the safety stop engages automatically. A touch of the up/down switch activates the platform to lift and stop automatically at vehicle floor level. Once the wheelchair has rolled off the platform, the first control switch will activate the lift to fold vertically inside the doors, which will close automatically.

SPECIFICATIONS:

Platform dimensions: 91.4 cm wide x 104 cm long (36" x 41") standard
Capacity: 454 kg (1000 lb)
Weight: 143 kg (315 lb)
Lift time:
Lower time:
Length of travel:

SAFETY FEATURES:

- safety wheel stop
- vinyl covered handrails
- platform stops automatically at safe, level positions
- emergency hydraulic system switch that bypasses all automatic functions
- hydraulic pump safety bypass valve

WARRANTY:

- one year on parts and workmanship

REMARKS:

- user or attendant operated
- side or rear door van installation
- remote control switch available
- extended platform lengths available for raised-door height vehicles
- meets V.A. specifications

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-hydraulic platform

OPERATION: Semi-automatic

MANUFACTURER:
Ratcliff Tail Lifts Ltd.
Bessemer Road
Welwyn Garden City, Hertfordshire
England AL7 1ET
Tel: Welwyn Garden (07073) 25571
Telex: 267520

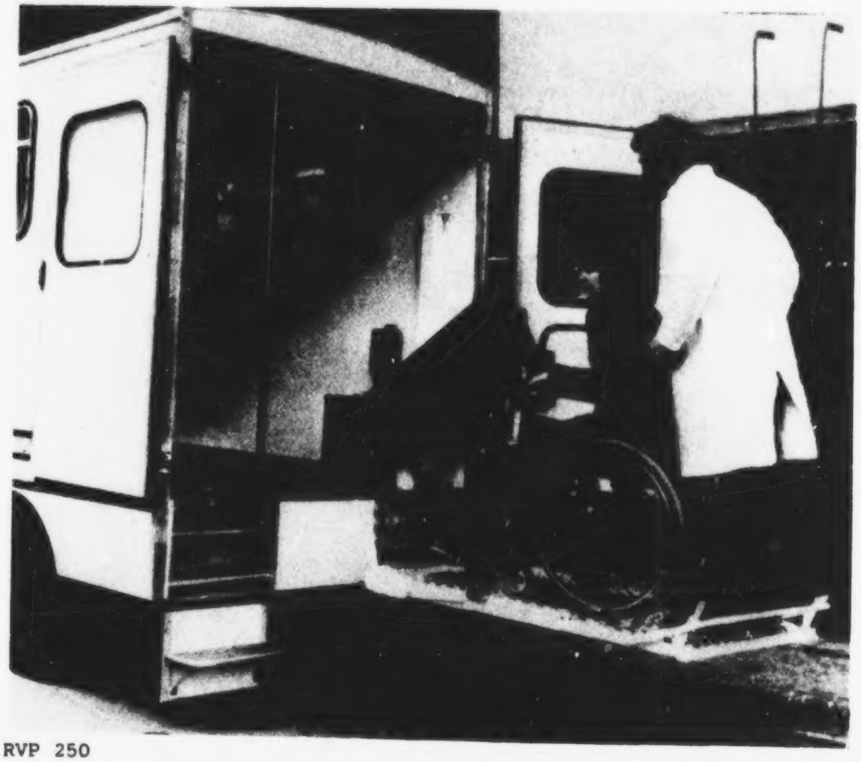
REPRESENTATIVE: Neil C. Dick, Sales Director

TRADE NAME: i) Foldaway ii) RVP 250

MODEL: RF250

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):



RVP 250

DESCRIPTION:

i) This electro-hydraulic platform lift is designed for installation in small vans with rear doors. It can also be fitted to the side door of larger vehicles. The folding platform, with detachable handrail, has two vertical arms that pivot on two parallel linkages attached to the lifting mechanism located in the vertical columns of the main structure. The power pac is generally located on the right hand vertical column. The spring-assisted platform folds manually and stows beneath the rear door windows. Lift power for the up/down mode is provided by a hydraulic cylinder acting on a cable system. The vehicle's electrical system drives the hydraulic pump. Push-button up/down controls are normally mounted on the inside of the vehicle near the rear door.

ii) This electro-hydraulic platform lift is suitable for side or rear door installation in institutional vehicles. The platform is attached to an L-shaped structure, which in turn is attached to a parallelogram linkage lifting arm located on one side of the platform. In a wide-bodied vehicle this allows easy ambulatory access past the lift system. The hydraulic lifting mechanism is located within the base structure attached to the floor of the vehicle. The folding platform incorporates a manually operated wheelchair stop bar, a folding bridge plate that acts as an upright safety stop, and a handrail. At ground level the platform is further away from the vehicle than most lifts to accommodate wheelchair passengers who cannot bend their legs. The platform folds manually to stow inside the vehicle. One hydraulic cylinder provides lift power for the up/down mode. The vehicle's electrical system drives the hydraulic pump. Push-button up/down controls are normally operated by a remote control system located on the inside of the vehicle near the door.

OPERATION:

i) The attendant places the handrail into position, unfolds the platform manually, and pushes the down control button to lower the platform to boarding level. Once the wheelchair is on the platform, the attendant pushes the up control button to raise the platform to vehicle floor height. The wheelchair rolls into the van and the attendant folds the platform into stowed position.

ii) Essentially the system operates as the "Foldaway" described above with the exception of the automatic bridge plate and the manually engaged wheelchair stop bar. The platform accommodates the attendant.

SPECIFICATIONS: Platform dimensions:	i)95 cm w x 107 cm l (37 1/2" x 42")	ii)80 cm w x 135 cm l (31 1/2" x 53")
Capacity:	250 kg (550 lb)	250 kg (550 lb)
Weight:	150 kg (330 lb)	150 kg (330 lb)
Lift time:	10 s, laden	6 s, laden
Lower time:	6 s, laden	6 s, laden
Length of travel:	66 cm (26")	99.5 cm (39") maximum

SAFETYFEATURES: i) . isolation switch
ii) . wheelchair stop bar
. raised bridge plate with pneumatic safety strip
. integral safety switch

WARRANTY:

REMARKS: i) . attendant operated
. commercial van, institutional vehicle and ambulance application
. available in two platform sizes
ii) . attendant operated
. institutional vehicle and ambulance application

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-hydraulic platform

OPERATION: Automatic

MANUFACTURER: Reb Manufacturing Inc.
P.O. Box 276, R.R. 2
Carey, OH
U.S.A. 43316
Tel: (419) 396-7651

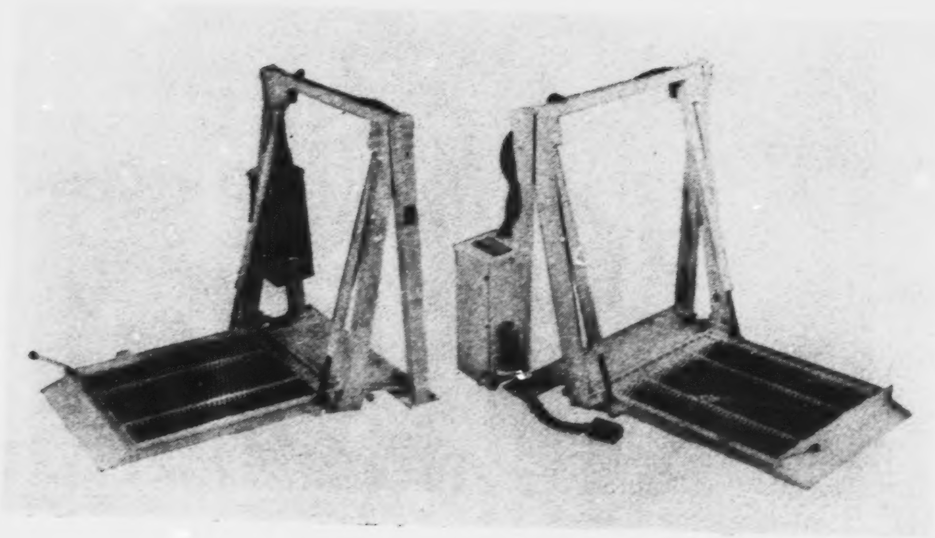
REPRESENTATIVE: Raymond L. Smalley, President

TRADE NAME: Two-In-One Lift

MODEL: 10500; 10500A; 10500B

PATENT NO.: 4,056,203 (U.S.)

SUGGESTED RETAIL
PRICE (1981):



DESCRIPTION:

This lift is an electro-hydraulic platform suitable for van application. The three models vary only in height and length of travel. The lift platform is attached to two square tubes that are part of the telescoping guide system for the up/down operation. The two externally located, double-acting hydraulic cylinders are directly attached to each side of the platform and to the top of the main frame structure. The lift is welded steel construction with an expanded metal platform. The platform incorporates fixed side wheel stops, a 7.6 cm (3") manual or automatic wheel stop that also acts as a boarding ramp, and a free floating safety bridge plate. A platform handrail is optional. The lift stows vertically in 20 cm (8") of space inside the van.

Lift power is provided by dual double-acting hydraulic cylinders for the up/down modes. The vehicle's electrical system drives the hydraulic pump, which may be located on the left or right column of the main frame. Fold and unfold operation is also electro-hydraulically operated.

Control switches are located according to operator requirements. Remote control is available.

OPERATION:

The lift operator opens the vehicle door, manually or automatically, and activates the switch to unfold the platform from vertical to horizontal position. Operating the up/down switch lowers the lift to ground level for boarding. After boarding, the manual or automatic wheel stop is engaged and the up/down switch is activated to raise the lift platform to vehicle floor level. When the wheelchair has rolled into the vehicle, the platform folds and is stowed in vertical position just inside the door.

SPECIFICATIONS:

Platform dimensions: 76 cm wide x 95 cm long (30" x 37 1/2") usable
Capacity: 454 kg (1,000 lb)
Weight: 141 kg (310 lb); 147.5 kg (325 lb); 156.6 kg (345 lb)
Lift time: 13 s; fold: 5 s
Lower time: 12 s; unfold: 5 s
Length of travel: 63.5 cm (25"); 68.5 cm (27"); 68.5 cm (27")

SAFETY FEATURES:

- equipped for manual operation in event of power failure
- sensor cut-off switch

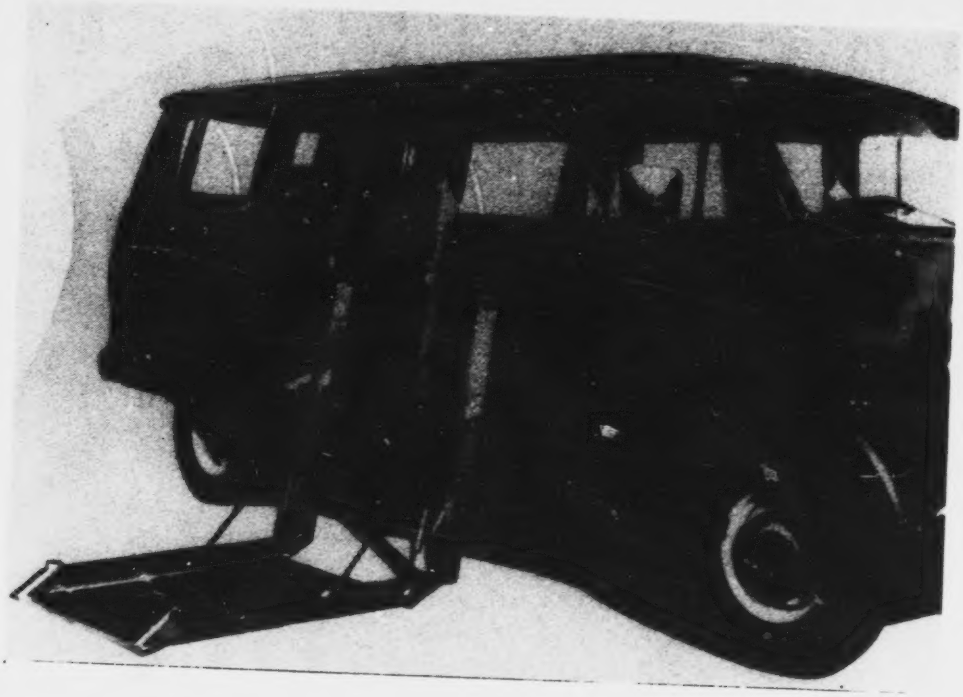
WARRANTY:

- one year or 19,200 km (12,000 miles)

REMARKS:

- user or attendant operated
- van application
- semi-automatic models available
- remote control available
- models available for bus and home applications

EQUIPMENT:	WHEELCHAIR LIFT
TYPE:	Electro-mechanical platform
OPERATION:	Automatic
MANUFACTURER:	Ricon Sales Inc. 11684 Tuxford St. Sun Valley, CA U.S.A. 91352 Tel: (213) 768-5890
REPRESENTATIVE:	
TRADE NAME:	
MODEL:	R-30A
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	$2,610 (U.S.)



DESCRIPTION:

This electro-mechanical platform lift is suitable for van application, with side or rear door installation. The lift frame is attached to two post assemblies that house the lifting and folding mechanism. The motor is mounted on one of the posts. The aluminium platform, a portion of which is constructed of see-through grill, incorporates fixed side safety stops and a powered flap that acts as both an entry ramp and a safety stop. The platform is stowed vertically, taking up 23 cm (9") of space inside the van door.

An electric motor, which drives a roller chain and sprocket mechanism, provides lift power. The vehicle's electric system drives the motor.

Operating switches are located on the platform arm, on the dash, and in a keyed control panel on the outside of the van. For attendant operation, controls may be mounted in other convenient locations, such as just inside the van door.

OPERATION:

The user unlocks the control panel on the outside of the van and activates the first switch to open the van door. The second switch unfolds the lift platform and the third lowers the platform to ground level. The user boards facing inward or outward. By activating the up/down control on the platform arm, the user raises the lift to vehicle floor level. The user rolls into the van and activates the switches to fold the lift and close the van door.

SPECIFICATIONS:

Platform dimensions: 77 cm wide x 96 cm long
(30 1/4" x 38")
Capacity: 363 kg (800 lb)
Weight: 68 kg (150 lb)
Lift time:
Lower time:
Length of travel:

SAFETY FEATURES:

- manual operation in event of power failure
- powered wheelchair safety stop
- will not fold with more than 22.7 kg (50 lb) on platform
- QUIKSTOP control system

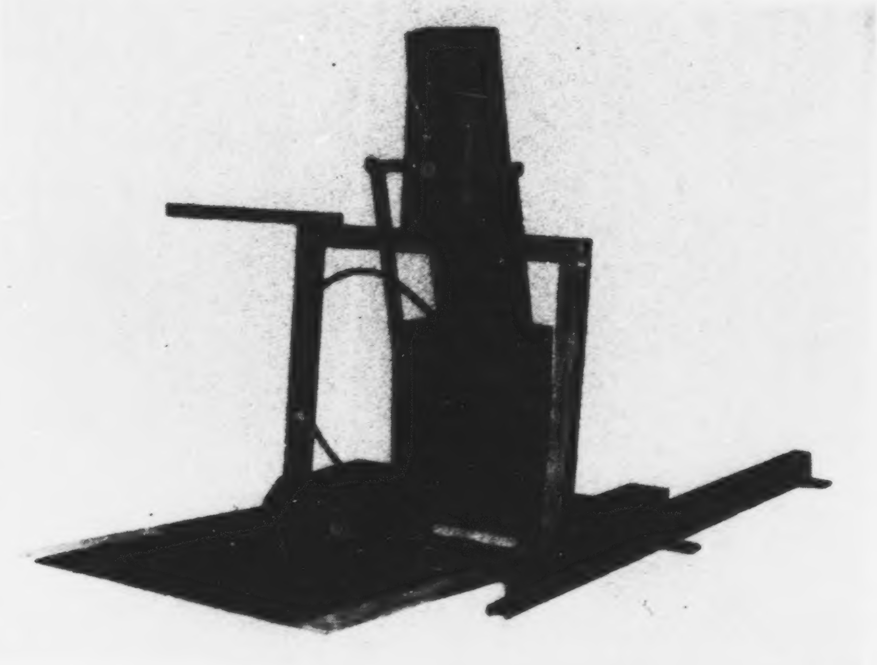
WARRANTY:

- one year on parts and workmanship

REMARKS:

- user operated
- van application
- side or rear door installation
- pre-wired for door openers
- remote control available
- R50 series availbale for van, bus and mobile home applications

EQUIPMENT:	WHEELCHAIR LIFT
TYPE:	Electro-hydraulic platform
OPERATION:	Automatic
MANUFACTURER:	Services Industriels Savaria Enr. 199 Ave. St. Joseph Oka, Que. Canada JON 1E0 Tel: (514) 479-6414
REPRESENTATIVE:	Pierre Savaria
TRADE NAME:	SIS
MODEL:	M-101
PATENT NO.:	Pending
SUGGESTED RETAIL PRICE (1981):	$2,500 (Cdn.)



DESCRIPTION:

This lift is an electro-hydraulic platform suitable for van installation. The lift frame is attached to the post assembly that contains the lifting mechanism. The platform features a metal safety stop device, which raises automatically in front of the chair's large wheels. The lift system is stowed opposite the side door on a floor track mounted perpendicular to the van door.

A hydraulic system provides lift power. The vehicle battery supplies electric power.

Operating swtiches are located on the movable arm of the lift and inside the van door. Remote controls to open and close the van door are available.

OPERATION:

The user opens the door manually or automatically and operates a switch just inside the door. This activates the lift to slide across the van floor and descend to ground level. The user backs onto the platform and the safety stop automatically raises to restrain the large wheels of the chair, preventing forward movement. A switch on the platform arm activates the raising of the platform to vehicle floor level. The user rolls into the van, and operates a switch that automatically stows the lift.

SPECIFICATIONS:

Platform dimensions: 80 cm wide x 82.5 cm long
(31 1/2" x 32 1/4")
Capacity: 317.8 kg (700 lb)
Weight: 95.3 kg (210 lb)
Lift time: 11 s
Lower time: 10 s
Length of travel: 78.7 cm (31")

SAFETY FEATURES:

- manual operation in case of power failure
- automatic chair locking device

WARRANTY:

- one year

REMARKS:

- user operated
- van application
- no vehicle modifications required
- remote control option
- pivoting driver's seat available

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-hydraulic platform

OPERATION: i) Automatic ii) Semi-automatic

MANUFACTURER: Skillcraft Industries Inc.
1270 Ogden Road
Venice, FL
U.S.A. 33595
Tel: (813) 488-1501

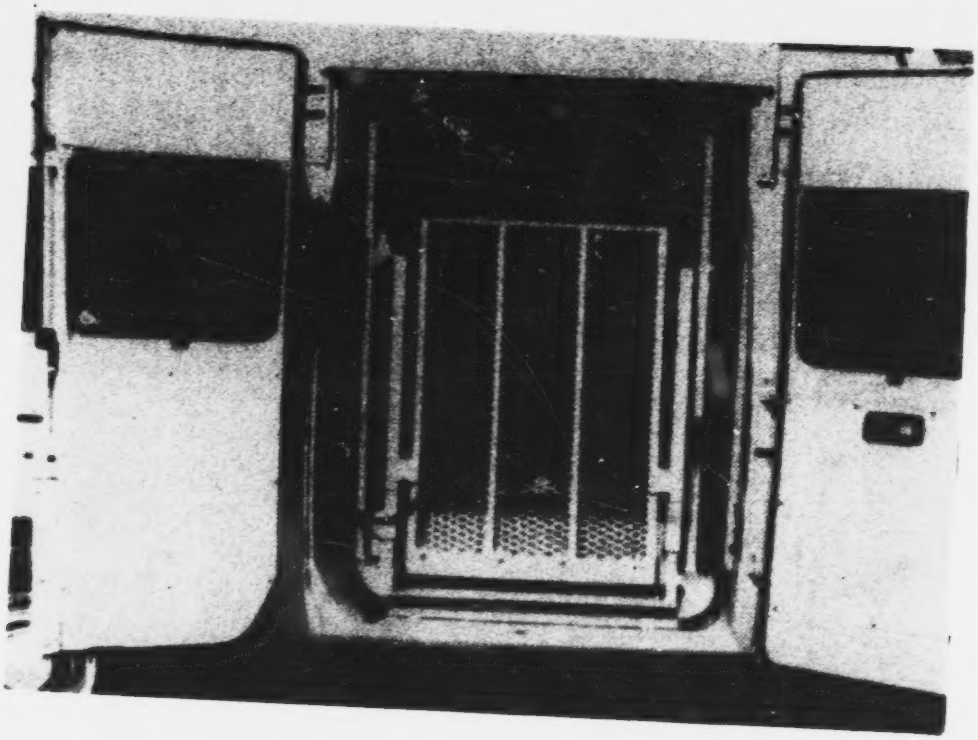
REPRESENTATIVE: Lee Huston, President

TRADE NAME:

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):



DESCRIPTION:

This lift is an electro-hydraulic platform suitable for side door installation in Dodge, Ford, GMC and Chevy vans. The platform is attached to two telescopic arms containing the lifting and lowering hydraulic cylinders. These arms are attached to two columns that are part of the main frame of the lift and are fixed inside the van. The expanded metal platform incorporates fixed side safety stops and an automatic front safety stop, which also acts as a boarding ramp. The platform stows vertically just inside the door.

Two dual-acting hydraulic cylinders provide lift power for the up/down mode. The vehicle's electrical system drives the hydraulic pump. In the automatic model, platform fold/unfold is accomplished by an electro-mechanical linear servo-actuator.

Location of control buttons is variable according to operator requirements and lift model. A door safety switch ensures that the hand controls cannot operate until the vehicle door is fully open.

OPERATION:

The lift operator opens the van door and activates a control button to unfold the platform of the automatic model. The platform of the semi-automatic model must be manually unfolded. Operating the up/down control lowers the lift to ground level for boarding. After boarding, the automatic safety stop engages before the lift rises to vehicle floor level. The lift is stowed after the wheelchair rolls off the platform into the van.

SPECIFICATIONS:

Platform dimensions: 76.2 cm x 111.7 cm (30" x 44")
Capacity: 408.6 kg (900 lb)
Weight: 124.8 kg (275 lb)
Lift time: 6 s
Lower time: 6 s
Length of travel: 71 cm (28")

SAFETY FEATURES:

- automatic wheel stop
- door safety switch

WARRANTY:

REMARKS:

- user or attendant operated
- side door van installation
- lift for rear bumper mount also available

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-hydraulic platform

OPERATION: i) Automatic ii) Semi-automatic

MANUFACTURER:
Target Industries Inc.
55 Newberry Road
Warehouse Point, CT
U.S.A. 06088
Tel: (203) 627-9329

REPRESENTATIVE: David Crand, President

TRADE NAME:

MODEL: T-500

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):

DESCRIPTION:

This lift is an electro-hydraulic platform suitable for van application. The platform is attached to two arms mounted in guideways attached to the main lift structure. The expanded metal platform incorporates fixed side safety stops and an automatic 15 cm (6") hinged endgate, which acts as a boarding ramp and a safety stop. The semi-automatic model has a 10 cm (4") endgate. The platform stows vertically just inside the van door.

A single-action hydraulic cylinder and a cable and pulley mechanism provide lift power. The vehicle's electrical system drives the hydraulic pump.

The location of control switches is variable according to lift model and operator requirements.

OPERATION:

The lift operator opens the van door, manually or automatically, and activates a switch to unfold the platform of the automatic model. The platform of the semi-automatic model must be folded and unfolded manually. Operating the up/down switch lowers the lift to ground level for boarding. After boarding, the automatic safety stop engages before the lift rises to vehicle floor level. The lift is stowed when the wheelchair rolls off the platform into the van.

SPECIFICATIONS:

Platform dimensions: 76.2 cm wide x 111.7 cm long (30" x 44")
Capacity: 272.4 kg (600 lb)
Weight:
Lift time: 6 - 8 s, depending on van height
Lower time: adjustable
Length of travel:

SAFETY FEATURES:

. platform safety stops

WARRANTY:

REMARKS:

. user or attendant operated
. van application
. T-600 automatic model available, featuring dual-entry platform

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-hydraulic rotary platform

OPERATION: i) Automatic ii) Semi-automatic

MANUFACTURER:
Total Mobility Systems & Designs Inc.
4060 Stewart Road
Eugene, OR
U.S.A. 97402
Tel: (503) 686-9706

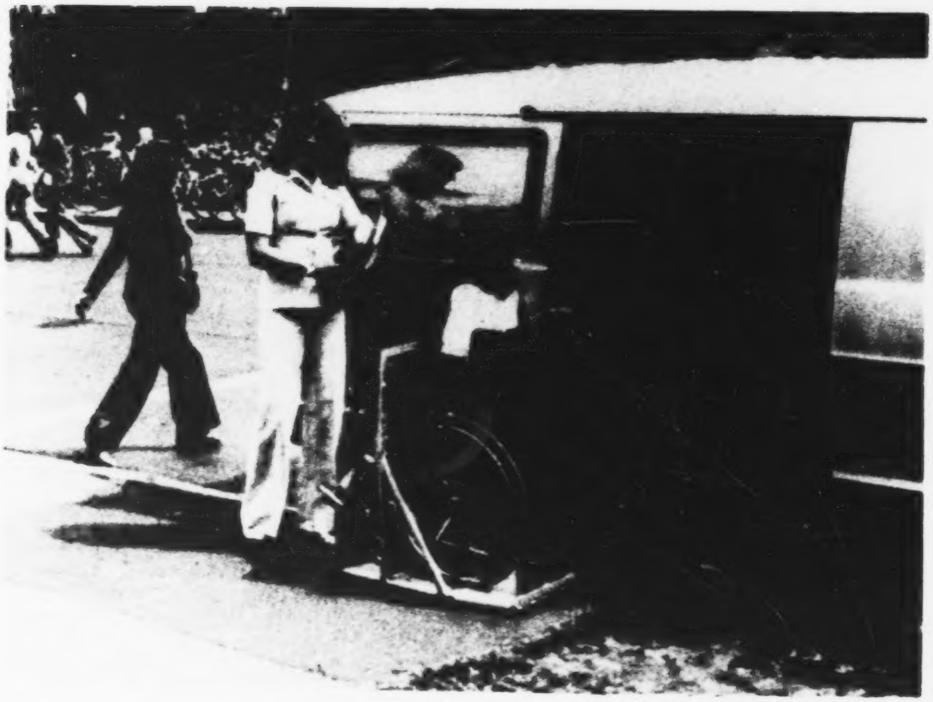
REPRESENTATIVE: Chris Casady, President

TRADE NAME: Safety Van Lift - II

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):
i) $2,550 (U.S.)
ii) $1,895 (U.S.)



DESCRIPTION:

This lift is an electro-hydraulic rotary platform suitable for installation in vans with sliding or fold-open doors. The platform frame is attached to the lift power column, which extends from floor to ceiling just in front of the right rear wheel well. The column is bolted through the floor and through the steel plate affixed to the roof ribs. The system is constructed of tubular steel with an expanded metal platform. The platform incorporates a fixed front wheel stop and a folding approach ramp that manually folds up behind the chair for security. The horizontal part of the frame acts as a security rail or grab bar. The stowed lift may rest on the van floor or be folded manually to take up only 30.4 cm (12") of space in the van.

A hydraulic cylinder provides lift power for the up/down operation. The vehicle's electrical system drives the hydraulic pump. The adjustable speed in/out operation is electrically driven.

The automatic model has two control stations, one mounted on the lift and one a keyed panel mounted on the outside of the van. The semi-automatic model comes with one control station, which is connected to a long hand-held lead. This model must be manually rotated in and out.

OPERATION:

The lift operator opens the van door and activates the control to swing the platform out (or rotates it out manually). The operator then activates the down switch to bring the platform to curb or ground level. The wheelchair passenger rolls onto the platform, the up control is activated and the platform rises to vehicle floor level. When the wheelchair rolls off the platform, the lift is automatically or manually stowed.

SPECIFICATIONS:

Platform dimensions: 91.4 cm wide x 91.4 cm long (36" x 36")
Capacity: 340.5 kg (750 lb)
Weight: 136.2 kg (300 lb)
Shipping weight: 159 kg (350 lb)
Lift time: 7 - 8 s
Lower time: 7 - 8 s
Length of travel:

SAFETY FEATURES:

- lift can be stopped in any position
- built-in front safety stop and folding approach ramp
- safety switches intertwined

WARRANTY:

REMARKS:

- user or attendant operated
- fits any U.S. van equipped with with sliding or fold-open doors and manufactured after 1969
- 96.5 cm (38") side clearance required
- automatic door opener not required
- lift does not block door opening
- no cutting of van necessary

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-hydraulic steplift

OPERATION: Automatic

MANUFACTURER: Transi-Lift Equipment Corp.
#105-1120-53rd Avenue N.E.
Calgary, Alta.
Canada T2E 6N9
Tel: (403) 275-8801

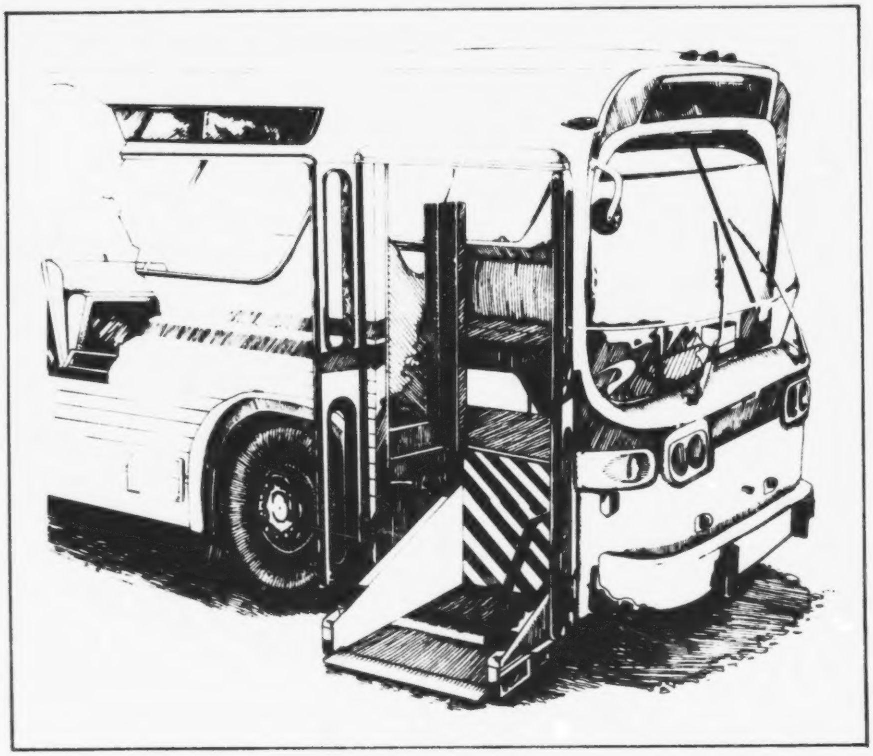
REPRESENTATIVE: Gordon Samber, General Manager

TRADE NAME: Transi-Lift

MODEL:

PATENT NO.: Patented 1979

SUGGESTED RETAIL
PRICE (1981):



DESCRIPTION:

This is an electro-hydraulic steplift suitable for installation in transit buses with bi-fold or plug doors. The two lower step treads and risers of the passenger entrance convert into the lift platform at floor level. Two covered hydraulic cylinders anchored to each post and to the bottom step transform the steps into a level platform. The members are only 1.3 cm (1/2") thick, making this a thin, easily boarded platform. A safety gate, 7.6 cm (3") high, is provided. Handrails on both sides move with the lift and, in stowed mode, are usable by the ambulatory. Two independent, fully self-contained electro-hydraulic pumps coupled to four hydraulic cylinders convert the two steps into a level platform, which can be raised and lowered. The devices for raising and lowering the platform are in two square hollow posts mounted at the top corners of the step well. In normal (stowed) configuration, these do not interfere with the egress of ambulatory passengers.

Two self-contained electro-hydraulic pumps provide lift power; one drives up/down and the other drives step/platform. The bus's electrical system provides power.

The control panel, with two self-cancelling switches, is mounted on the dash. One switch activates the step to platform mode and its reverse; the second switch raises and lowers the platform. Additional remote controls may be provided for use by an attendant at street level.

OPERATION:

The bus driver controls the lift from driving position through two switches mounted on the dashboard. The first converts the steps into the platform and the second lowers the platform to ground or curb level for boarding. When the wheelchair passenger is on the platform, the safety stop automatically engages and the driver raises the lift. After the wheelchair has left the platform, the driver converts the platform back into step configuration.

SPECIFICATIONS:

Platform dimensions: 83.8 cm wide x 109.2 cm long (33" x 43")
Capacity: 454 kg (1,000 lb)
Weight: 317.8 kg (700 lb)
Lift time: 14 s
Lower time:
Cycle time: 35 s
Length of travel:

SAFETY FEATURES:

- manual pump back-up
- automatic safety gate
- self-levelling platform conforms to grade or slope
- interlocked control switches to prevent operator error
- safety skirt in conjunction with lowering of platform

WARRANTY:

- one year on parts
- ninety days on parts and labour

REMARKS:

- bus driver operated
- transit bus application
- custom-designed lifts for light rail application

EQUIPMENT: WHEELCHAIR LIFT

TYPE: Electro-hydraulic steplift

OPERATION: Automatic

MANUFACTURER: Transportation Design and Technology, Inc.
9530 Cabot Drive
San Diego, CA
U.S.A. 92126
Tel: (714) 578-9420

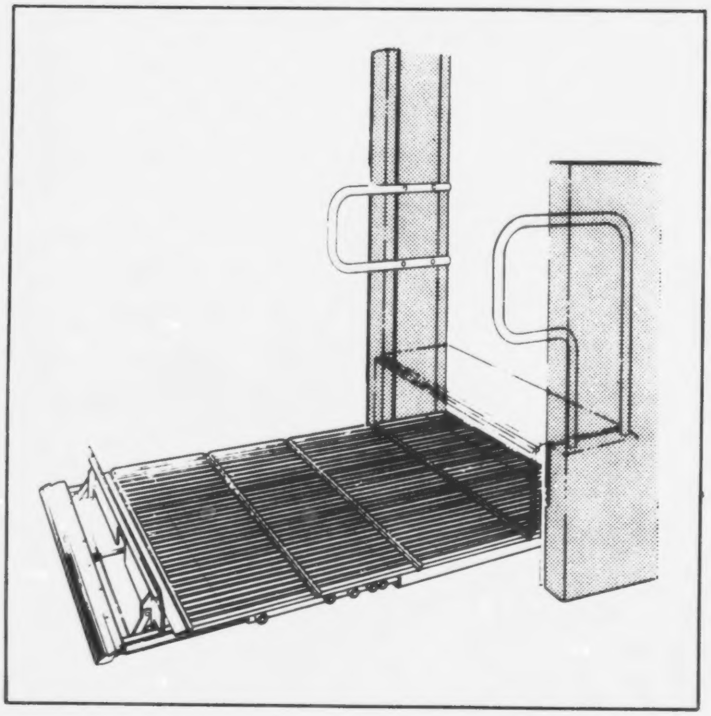
REPRESENTATIVE: Jack Siuta, Director of Sales

TRADE NAME: Steplift

MODEL: Series 50

PATENT NO.: 4,027,807 and 4,081,091 (U.S.)

SUGGESTED RETAIL PRICE (1981): $7,400 (U.S.)



DESCRIPTION:

This electro-hydraulic steplift is suitable for transit bus and rail applications. In stowed position, the lift forms the treads of the first two steps, forward riser and (hidden) aft riser, plus a hinged 30.4 cm - 35.5 cm (12" - 14") safety barrier, which folds over the bottom step. When the lift is deployed, the side rails, which are mechanically locked in the stow position, slide out to unfold the steps to a 127 cm (50") platform rising approximately 71 cm (28") to clear any obstruction. As the lift unfolds, a safety barrier rises perpendicular to the platform, and mechanically locks in place. The lower step, and front end of the platform, has a sensitive edge. The elevator-type lift has a lifting cylinder in the rear tower. Two additional cylinders form the platform.

The bus power steering pump, or a separate continuous duty pump and motor, provides hydraulic power. The bus electrical system provides power.

A small module services all components from inside the bus. It houses the entire system, consisting of a hand pump, valve pack, a relay and electrical buss.

The controls consist of four switches: an illuminated on/off switch, a rocker switch for lift deployment, a separate switch for the safety barrier and a stow guard switch to lock the lift mechanically. The control panel can be mounted anywhere.

OPERATION:

The bus driver operates the lift from the control console near the driver's seat. First the bus door is opened and the vehicle's service brakes and accelerator interlock are activated to prevent vehicle movement. The platform is then extended and lowered. When completely lowered, the platform bridges the curb or pavement and the vehicle. Once the wheelchair is on the lift, the safety gate is raised and the passenger lifted to vehicle floor level. When the platform is clear, the lift is stowed in step configuration. The interlock is then released and the doors closed.

SPECIFICATIONS:

Platform dimensions: 86.3 cm wide x 127 cm long (34" x 50")
Capacity: 454 kg (1000 lb)
Weight: 220-249.7 kg (485-550 lb)
Lift time: 12 s
Cycle time: adjustable - 36 s maximum
Length of travel: varies with bus floor

SAFETY FEATURES:

- handpump for manual operation in event of power failure
- wheel stop
- grab rail
- pressure sensitive sensors
- positive interlocks
- anti-fold protection

WARRANTY:

- one year
- manufacturer prefers to service lifts

REMARKS:

- bus driver operated
- transit bus application
- front door installation
- 5° ramp angle

EQUIPMENT:	WHEELCHAIR LIFT	
TYPE:	Hydraulic steplift	
OPERATION:	Automatic	
MANUFACTURER:	Vapor International Vapor Corporation 6420 West Howard St. Chicago, IL U.S.A. 60648 Tel: (312) 631-9200 Telex: 724348	Vapor Canada Inc. 3955 de Courtrai Ave. Montreal, Quebec Canada H3S 1B9 Tel: (514) 342-3210
REPRESENTATIVE:		R. Forrest, Transportation Systems Division
TRADE NAME:	Travelift	
MODEL:	57977100 (or similar)	
PATENT NO.:	4,180,366 (U.S.)	
SUGGESTED RETAIL PRICE (1981):	Available on request only	

DESCRIPTION:

This hydraulic steplift is suitable for front or rear door transit bus and minibus installation as well as rail coach and light rail application. In the stowed position, the lift forms the treads and risers of the bottom two bus steps. Hydraulic cylinders located in towers on both sides of the platform control lift operation. One pair of cylinders forms the platform (and reforms the steps). The other pair raises and lowers the platform vertically, using a scissors mechanism. The lift platform has three sensitive edges. The sensor on the outer edge of the platform ramp stops the lift if an obstruction is contacted as the platform extends. Any of the three sensors (two of which are on the underside of the platform) stops descent if an object is encountered, or when the lift reaches the curb or ground. Two reaction switches act as redundant sensors in lowering the lift. The platform features a ramp - 28 cm (11") wide, 8° angle - that can serve as a bridge between curb and bus and as a safety endgate when the lift is raised or lowered.

The vehicle's hydraulic system provides hydraulic lift power. A separate motor-driven hydraulic pump can also be provided for buses not having hydraulic power steering. The bus's electrical system provides power.

Lift controls are located to suit the operator. The control panel features eight recessed buttons, six of which light up to indicate the next step in the lift cycle sequence.

OPERATION:

The bus driver controls every sequence of the lift cycle from a control console to which the driver alone has access. If attendant operated, the control console could be located near the entrance door. The platform is activated to extend itself, and then lowers to curb or ground level. The ramp is then activated to lower for wheelchair boarding. The ramp engages as a protective mechanism behind the chair and the platform rises to vehicle floor level. When the wheelchair has left the platform, the driver activates the lift to stow in step configuration.

SPECIFICATIONS:

Platform dimensions: 86 cm wide x 122 cm long (34" x 48") plus 28 cm (11") ramp
Capacity: 454 kg (1000 lb)
Weight: 295 kg (650 lb)
Lift time: depends on vehicle floor height, approximately 7.6 cm (3") per second as required to fit application
Lower time:
Length of travel:

SAFETY FEATURES:

- manual operation in event of power failure (hydraulic and electrical)
- door cannot close or vehicle move until lift is stowed in step configuration
- platform cannot operate until door is opened

WARRANTY:

- twelve months
- contact manufacturer for limited warranty policy

REMARKS:

- bus driver operated

II WHEELCHAIR SECUREMENTS

The safe transportation of a wheelchair user in a moving vehicle is essentially a problem of securing the wheelchair and restraining the occupant.

Basically there are two concepts of wheelchair securement:

- devices securing the wheel
- devices securing the frame.

Both categories of devices include manual, semi-automatic and automatic models. As the strength and dexterity of disabled persons varies, so too does their ability to operate securement devices. This compendium classifies manual systems as attendant operated, and automatic systems as user operated. Manual systems are suitable for school bus and commercial services where an attendant operates the securement device. Automatic systems are suitable for customized vehicles and for standard transit buses. For all types of transportation except mass transit, it is generally accepted that lap and torso restraining belts, fastened to the vehicle, are to be used in conjunction with the wheelchair securement device.

Significant factors affecting the safe securement of wheelchairs and users are:

- lack of universal safety standards
- various chair and wheel sizes
- different wheelchair positioning within the vehicle
- various passenger restraint systems
- easily damaged standard wheelchair
- increase in use of non-conventional wheelchairs.

WHEELCHAIR SECUREMENTS

MANUFACTURER	TYPE	OPERATION			INSTALLATION		POINT OF ATTACHMENT TO WHEELCHAIR								REMARKS
							WHEEL		FRAME						
		MANUAL	SEMI AUTOMATIC	AUTOMATIC	VEHICLE FLOOR	VEHICLE WALL	RIM	TIRE	FORWARD POST	FOOTREST	CASTOR ARCH	BOTTOM RAIL	CROSS BRACE	BACK POST	
1. ADVANCED MOBILITY, INC.															
2. AEROQUIP CORP.	i) 3-Point Belt	X			X				X				X		
	ii) 4-Point Belt	X			X				X					X	All systems in conjunction with floor track
	iii) One Buckle	X			X				X					X	
3. AMERICAN SEATING CO.	Rim Pin		X				X								In conjunction with flip-up bus seat
4. APENER MASCHINENBAU UND FÖRDERANLAGEN (AMF)	Stabilizing Bars with belts	X			X				X					X	
5. THE BRAUN CORPORATION	i) Over-The-Centre	X			X						X				
	ii) Chair Lock for Driver			X	X				X						
	iii) Cam Lock	X			X					X					
	iv) 4-Point Belt	X			X				X					X	In conjunction with floor track
	v) Rim Pin	X			X		X								
6. BUD INDUSTRIES, INC.															
7. C.N. UNWIN LTD.	Stemlock Clamp	X			X							X			Must be used in pairs
8. CHAS. OLSEN & SONS	Framelock	X			X	X			X						Cannot be used in rear facing position Seat belt holders provided
9. COACH AND CAR EQUIPMENT CORP.	Rim Pin		X				X								In conjunction with flip-up bus seat Secures one wheel

WHEELCHAIR SECUREMENTS

MANUFACTURER	TYPE	OPERATION			INSTAL-LATION		POINT OF ATTACHMENT TO WHEELCHAIR								REMARKS
							WHEEL		FRAME						
		MANUAL	SEMI AUTOMATIC	AUTOMATIC	VEHICLE FLOOR	VEHICLE WALL	RIM	TIRE	FORWARD POST	FOOTREST	CASTOR ARCH	BOTTOM RAIL	CROSS BRACE	BACK POST	
10. COLLINS INDUSTRIES, INC.	i) Rim Pin	X			X		X								
	ii) Rim Pin		X		X		X								Mechanical release
	iii) Rim Pin			X	X		X								Electric release
11. CREATIVE CONTROLS INC.	i) Driver Framelock			X	X										All systems require adaptive hardware on the wheelchair for attachment
	ii) Standard Framelock			X	X										
	iii) Low'r-n-Lock			X	X										
12. CROW RIVER INDUSTRIES, INC.	i) 3-Point Belt	X			X						X		X		Floor track
	ii) 4-Point Belt	X			X						X			X	Floor track
13. DRIVE-MASTER CORP.	i) Rim Pin	X			X		X								
	ii) Anchor Rod	X			X								X		
	iii) Chair Lock for Driver			X	X				X						Wall mounting optional
14. DYNAMIC MOBILITIES, INC.	4-Point System with Power Pan			X											
15. ELECTRO VAN LIFT, INC.	3-Point Belt	X			X				X						In conjunction with lap and torso restraint assembly
16. FRED SCOTT & SONS	T-Bar	X			X							X			In conjunction with pelvic seat belt
17. GRESHAM DRIVING AIDS, INC.	i) Rod and Hook	X			X										Attaches to top rail or side frame spacers of chair, or hooks over wheel
	ii) T-Bar	X			X										
	iii) Chair Lock for Driver			X	X			X				X			
18. HANDICAPS INC.	Belt and Bracket	X			X										Belts loop around armrests and across occupant Wheelwells recommended

WHEELCHAIR SECUREMENTS

MANUFACTURER	TYPE	OPERATION			INSTALLATION		POINT OF ATTACHMENT TO WHEELCHAIR								REMARKS
							WHEEL		FRAME						
		MANUAL	SEMI AUTOMATIC	AUTOMATIC	VEHICLE FLOOR	VEHICLE WALL	RIM	TIRE	FORWARD POST	FOOTREST	CASTOR ARCH	BOTTOM RAIL	CROSS BRACE	BACK POST	
19. HANDI-RAMP INC.	i) Belt and Bracket	X			X	X			X						Also restrains user
	ii) Rim Pin	X			X	X	X								
	iii) Frame Anchor	X			X								X		
20. MOBILITY DYNAMICS INC.	T-Bar	X			X							X			
21. PARA INDUSTRIES (1978) LTD.	i) T-Bar	X			X							X			
	ii) Chair Lock for Driver			X	X										Adaptive hardware required on the wheelchair for attachment
22. ROOTES MAIDSTONE LTD.	Stemlock Clamp	X			X							X			In conjunction with strap assembly
23. SASKATCHEWAN COUNCIL FOR CRIPPLED CHILDREN & ADULTS	Cable and Hook	X											X		In conjunction with flip-up seat
24. SKILLCRAFT INDUSTRIES, INC.	T-Bar	X			X							X			
25. TARGET INDUSTRIES INC.															
26. TRANSI-LIFT EQUIPMENT CORP.	Rim Clamp			X	X		X								Usually used in conjunction with flip-up seats Retractable seat belt supplied
27. TRANSPORTATION DEVELOPMENT CENTRE	i) Securement Arm	X			X	X		X							Multi-modal application Lap and torso belt provided
	ii) Securement Arm	X			X	X		X							Rail application Lap belt provided

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE:

OPERATION:

MANUFACTURER: Advanced Mobility, Inc.
15912 Arminta Street
Van Nuys, CA
U.S.A. 91406
Tel: (213) 782-0200

REPRESENTATIVE: Scott Deacon

TRADE NAME:

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):

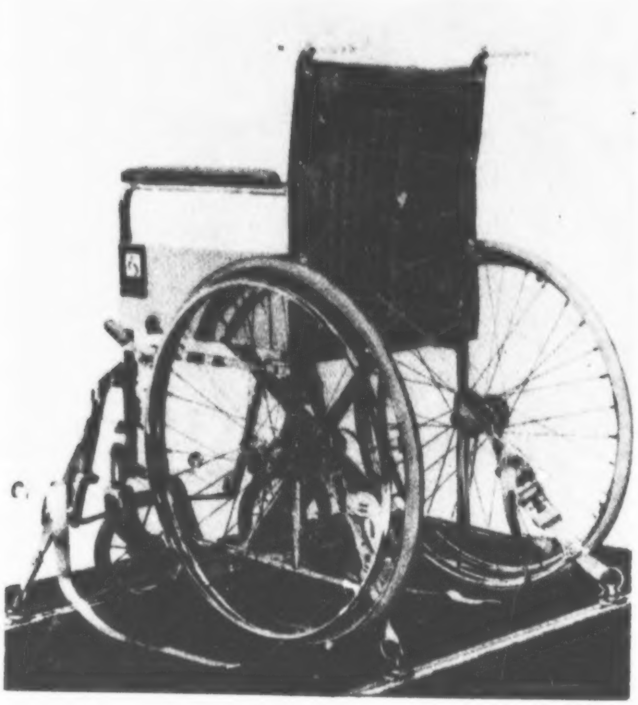
DESCRIPTION AND OPERATION:

SPECIFICATIONS:

INSTALLATION:

REMARKS:

EQUIPMENT:	WHEELCHAIR SECUREMENT	
TYPE:	Belt and track	
OPERATION:	Manual	
MANUFACTURER:	Aeroquip Corp. Industrial Division 1225 West Main St. Van Wert, OH U.S.A. 45891 Tel: (419) 238-1190	Aeroquip (Canada) Ltd 287 Bridgeland Avenue Toronto, Ontario Canada M6A 1Z7 Tel: (416) 789-1831
REPRESENTATIVE:		W.D. Heeley, Vice President Marketing
TRADE NAME:		
MODEL:	Series G: three- or four-point attachment system Series E/A: three- or four-point attachment system One-buckle tensioning system	
PATENT NO.:		
SUGGESTED RETAIL PRICE (1981):		



DESCRIPTION AND OPERATION:

Both series consist of a combination of belts, hooks, 'D" rings, ratchet buckles and companion floor-mounted tracks .

Front leg attachment: (both series) the belts' track fittings are positioned 12.7 cm-25.4 cm (5"-10") outside the front wheels. The other ends of the belts loop around the front of the chair frame and clip into 'D" rings. The tensioning straps are pulled tight. The buckle cam is pressed to release.

Rear leg attachment: (four-point system) the belts' track fittings are positioned just inside the back wheel. The straps are wrapped around the back of the chair frame and hooked. Tension is achieved by operating the ratchet buckle handle. Tension is released by pulling down the release pawl on the ratchet buckle.

Rear attachment: (three-point system) the rear assembly is positioned midway between rear wheels, and the belt is looped through the cross brace and hooked. Tension and release is the same as for the four-point system.

Rear attachment: (one-buckle system) track fittings are positioned below and just inside the rear wheels with the ratchet buckle assembly centred. The strap ends are looped around each side of the chair frame and hooked into 'D" rings. Tension is applied with the ratchet buckle.

SPECIFICATIONS:	All assemblies have a minimum track strength of 1,136 kg (2,500 lb) per tie-down leg.
INSTALLATION:	. tracks are mounted on vehicle floor
REMARKS:	. attendant operated . used in California school systems . approved by California Highway Patrol

EQUIPMENT:	WHEELCHAIR SECUREMENT
TYPE:	Rim pin
OPERATION:	
MANUFACTURER:	American Seating Company Transportation Seating Division 901 Broadway N.W. Grand Rapids, MI U.S.A. 49504 Tel: (616) 456-0673
REPRESENTATIVE:	Lew Wickman
TRADE NAME:	
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	

DESCRIPTION AND OPERATION:

SPECIFICATIONS:

INSTALLATION:

REMARKS:

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE: Stabilizing bars with belts

OPERATION: Manual

MANUFACTURER: Apener Maschinenbau und Förderanlagen (AMF)
Gustav Bruns GMBH & Co. KG
2913 Apen (OLDB)
Federal Republic of Germany
Tel: (0 49 82) 52 25/6
Telex 25 1112 amf d

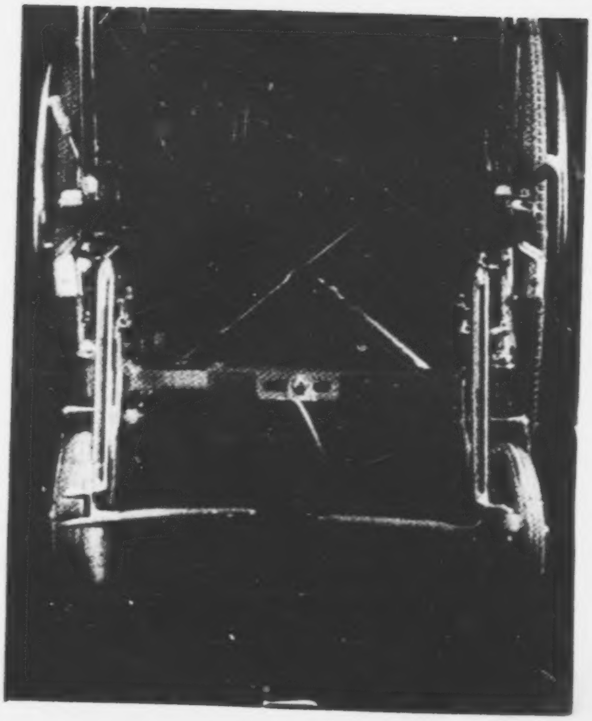
REPRESENTATIVE:

TRADE NAME:

MODEL:

PATENT NO.:

SUGGESTED RETAIL
PRICE (1981):



DESCRIPTION AND OPERATION:

The system consists of two self-adjusting telescopic bars with attached belts. The front horizontal bar attaches to the lower part of the chair's forward posts. A roller-equipped belt is attached to the centre of the bar. The free end of this belt attaches to a floor fitting and when the wheelchair is pushed forward, the belt roller automatically takes up the slack. The rear horizontal bar attaches to the back posts at a point near the wheel axles. Two adjustable belts are attached to this bar. The free ends of these belts also attach to floor fittings. A seat belt assembly, which attaches to the rear belts, is optional.

SPECIFICATIONS:

INSTALLATION:

REMARKS:	. attendant operated . adapts to most wheelchair models

EQUIPMENT:	WHEELCHAIR SECUREMENT
TYPE:	i) Over-the-centre ii) Chair lock for driver iii) Cam lock iv) Four-point belt v) Rim pin
OPERATION:	i) Manual ii) Automatic iii) Manual iv) Manual v) Manual
MANUFACTURER:	The Braun Corp. 1014 South Monticello St. Winamac, IN U.S.A.46996 Tel: (219) 946-6157
REPRESENTATIVE:	Tom Bonnell
TRADE NAME:	
MODEL:	i) 10621 ii) 77141 iii) 11072 iv) 11314, 11315, 11316 v) 11031
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	i) $75 (U.S.), $97 (U.S.) installed ii) $281 (U.S.), $324 (U.S.) installed iii) $89 (U.S.), $97 (U.S.) installed iv) Track $8 (U.S.) per ft., $15 (U.S.) installed Manual belts $23 (U.S.), Ratchet belts $40 (U.S.) v) $72 (U.S.), $94 (U.S.) installed

Standard Over-the-Centre Tie Downs

Cam Lock

DESCRIPTION AND OPERATION:

i) The system consists of two adjustable rods each fitted with an over-the-centre latching mechanism. One end of the rod hooks into a floor fitting and the latch end hooks over the caster arches of the wheelchair. There is 1.9 cm (3/4") of tightening when the latch is closed.
ii) The system consists of a pivoting clamp-down bar mounted on a column. The bar is pivoted by an electric screw actuator, which can exert a force of approximately 182 kg (400 lb) on the arm rest or lower forward post of the wheelchair. The control switch is mounted on the pivoting bar.
iii) The system consists of a manually operated cam lock fitted on an arm located in a position to engage the right foot rest or other frame member of the wheelchair.
iv) Traditional web belts with buckles in conjunction with floor-mounted track.
v) The system consists of two floor-mounted posts, each fitted with adjustable U-shaped bracket and pin assemblies.

SPECIFICATIONS:

INSTALLATION: . no special installation procedures required

REMARKS:
i) . attendant operated
. must be adjusted for specific wheelchair
ii) . user operated, driver application
iii) . user or attendant operated
iv) . attendant operated
v) . attendant operated
. semi-automatic and automatic models available, which may be user operated

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE:

OPERATION:

MANUFACTURER:
Bud Industries, Inc.
100 West Pulaski Street
West Warwick, RI
U.S.A. 02893
Tel: (401) 822-2352

REPRESENTATIVE: Bill Durett

TRADE NAME:

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):

DESCRIPTION AND OPERATION:

SPECIFICATIONS:

INSTALLATION:

REMARKS:

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE: Stemlock clamp

OPERATION: Manual

MANUFACTURER: C.N. Unwin Limited
Adam's Peak Works
Lufton
Yeovil, Somerset
England BA22 8SZ
Tel: Yeovil (0935) 5359

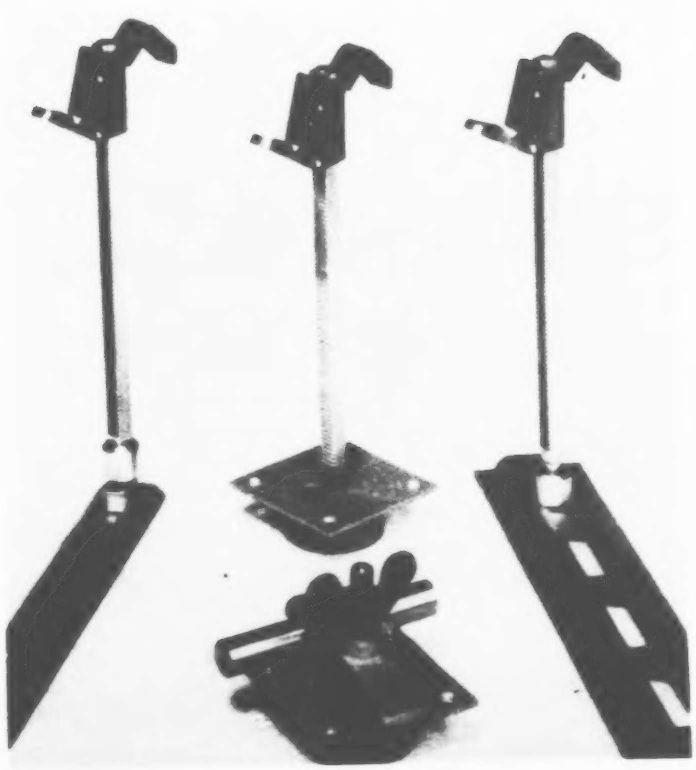
REPRESENTATIVE: C.N. Unwin, Director

TRADE NAME: QUIKLOCK Clearface Clamp

MODEL:

PATENT NO.: Pending

SUGGESTED RETAIL PRICE (1981):



DESCRIPTION AND OPERATION:

The system, to be used in pairs, consists of a metal ratchet type stem with a clamping head and an attached operating lever. The foot of the ratchet inserts into a metal baseplate flush with the vehicle floor. It may also be inserted in floor-mounted tracks, which would allow greater flexibility for positioning chairs. The operating lever can be freed from the ratchet for raising the clamping head and re-engaged to the ratchet when lowered to clamp onto the bottom rails of the chair. The unit can rotate 360° and accepts some angular movement thus enabling different size chairs to use the same base fittings.

SPECIFICATIONS:

Maximum clamping height: 28.6 cm (11 1/4")
Minimum clamping height: 8.9 cm (3 1/2")
Weight of clamp: 595 g (21 oz.)
Weight of base: 425 g (15 oz.)

INSTALLATION:

- care is necessary to ensure that baseplates are correctly positioned and bolted into place

REMARKS:

- attendant operated
- baseplate fitting leaves vehicle floor unobstructed when unit not in use
- custom clamps available

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE: Framelock

OPERATION: Manual

MANUFACTURER:
Chas. Olsen & Sons
677 Transfer Rd.,
St. Paul, MN
U.S.A. 55114
Tel: (612) 641-3900

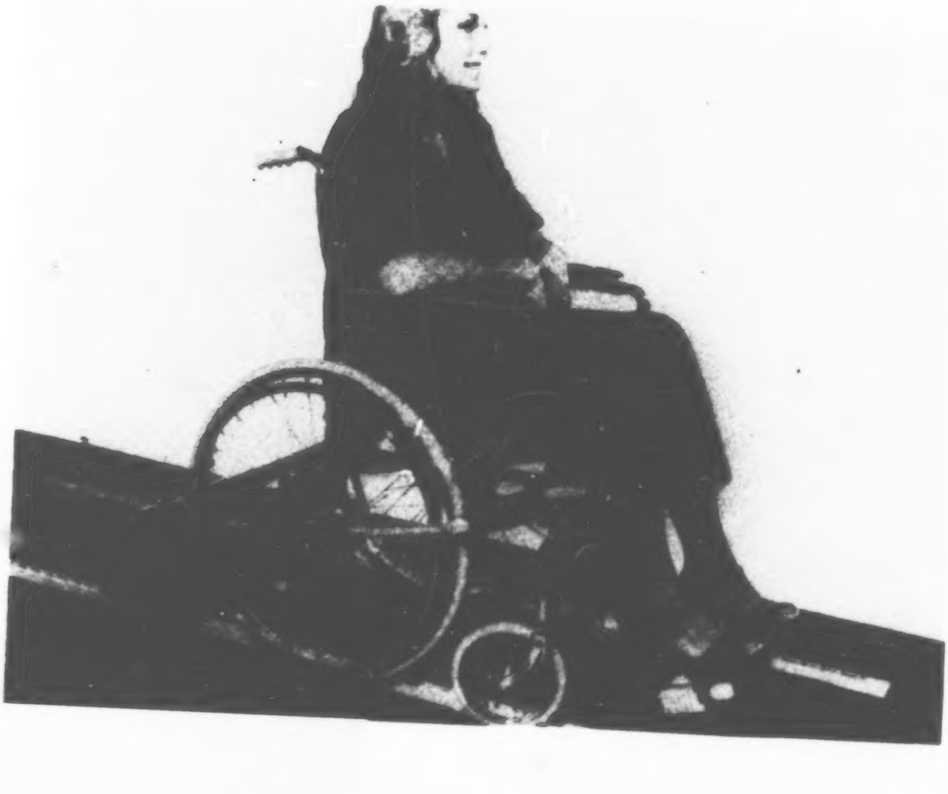
REPRESENTATIVE: Richard A. Bunde, Vice President

TRADE NAME: FRAMELOCK

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):



DESCRIPTION AND OPERATION:

The basic system consists of a T-bar and two framelock arm assemblies. The T-bar may be mounted on:

- two panel assemblies fitted on floor tracks (forward facing)
- a vehicle wall, using an angle bracket (side facing)
- a school bus chair rail (side facing).

The two framelock arms are attached to the T-bar permitting lateral adjustment. The length of the arm is adjustable and a lever-operated, over-the-centre lock engages the hooked end onto the forward posts of the chair. The rear wheels butt against the T-bar. A cam action locking device keeps the arms upright for unobstructed wheelchair positioning.

SPECIFICATIONS: Aluminium alloy floor track: 106.1 cm (42") long
T-bar: 91.4 cm (36") long

INSTALLATION:

- floor: track-mounted with bolts spaced 20.3 cm (8") apart
- wall : T-bar installed on a 5 cm x 5 cm x 0.9 cm (2" x 2" x 3/8") angle bar on the structural portion of the inside shell of the vehicle
- school bus: assembly bolted on existing chair rail

REMARKS:

- user or attendant operated
- seat belt holders provided
- adjusts to most wheelchair models
- system may not be mounted in rearward facing position
- conventional bus seats may be removed by using 'lock on - lift off' seat lock mechanism
- approved by State of Minnesota Dept. of Public Safety

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE: Rim pin

OPERATION: Semi-automatic

MANUFACTURER: Coach and Car Equipment Corp.
1951 Arthur Avenue
Elk Grove Village, IL
U.S.A. 60007
Tel: (312) 437-5760

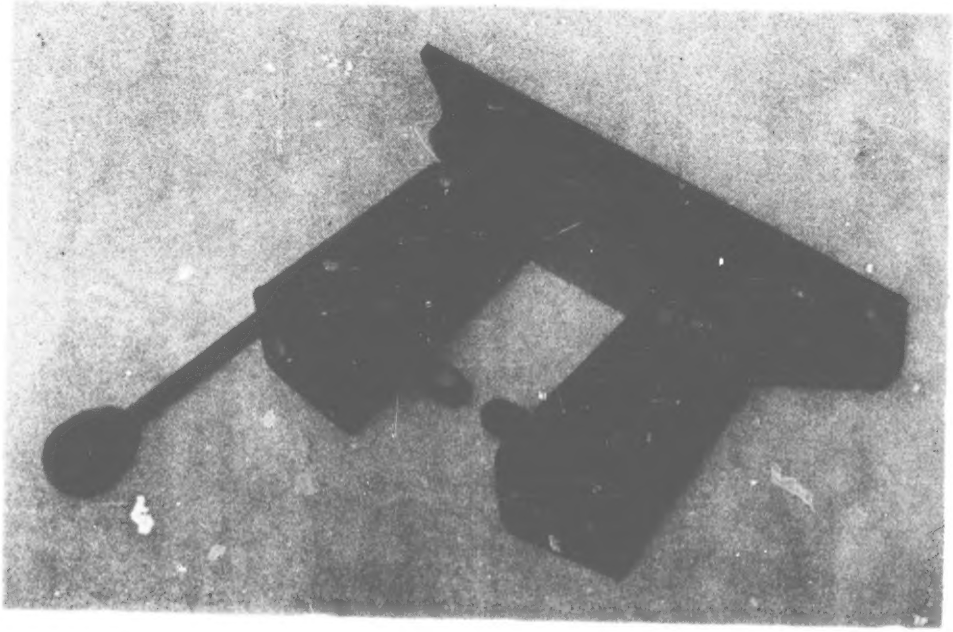
REPRESENTATIVE: Joe Lamb, Vice President, Marketing

TRADE NAME:

MODEL: 303

PATENT NO.: 4,221,396 (U.S.)

SUGGESTED RETAIL PRICE (1981): $105 (U.S.) approx.



DESCRIPTION AND OPERATION:

The system consists of a U-shaped metal mechanism that bolts to a bracket underneath a fold-up coach seat, to the bulkhead, or to other structural members of a vehicle or rail car, at approximately mid-wheel height. The locking mechanism is automatically actuated by the large wheel of the chair pushing against the rear plate in the opening. Two pawls engage ahead of the rim to secure the wheel. The lock is manually disengaged by lifting the release handle.

SPECIFICATIONS:

Overall dimensions: 22.8 cm wide x 14.6 cm deep x 4.9 cm thick (9" x 5.75" x 1.94") (less handle)
Maximum wheelchair wheel and driving rim width:
7 cm (2.75")
Maximum wheelchair wheel and driving rim depth:
6.6 cm (2.62")
Weight: 2 kg (4.5 lb)

INSTALLATION:

- two mounting holes are provided on 20.3 cm (8") centres for 3/8" bolts.

REMARKS:

- user or attendant operated
- adapts to most wheelchair models as only one wheel is secured

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE: Rim pin

OPERATION: i) Manual ii) Semi-automatic iii) Automatic

MANUFACTURER:
Collins Industries, Inc.
Special Products Division
P.O. Box 58
Hutchinson, KS
U.S.A. 67501
Tel: (316) 663-4441

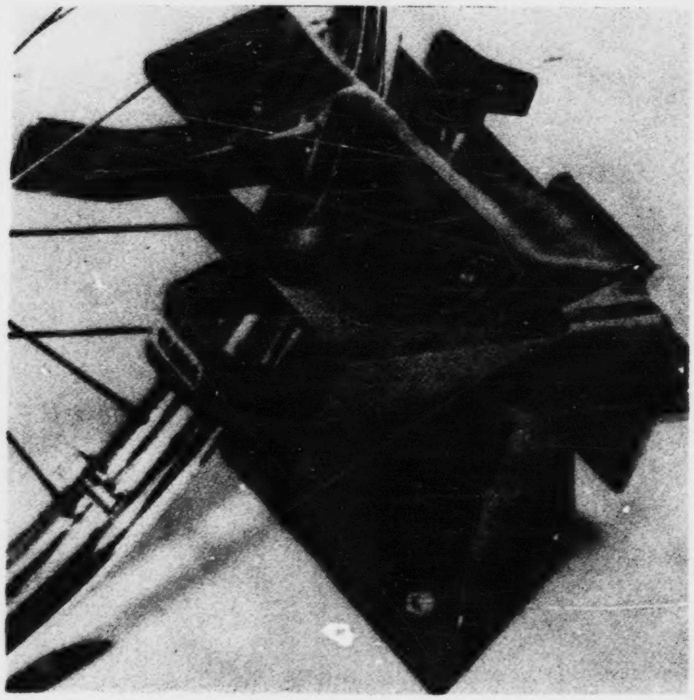
REPRESENTATIVE: William W. Hinze, Sales Manager, Special Products/O.E.M. Accounts

TRADE NAME: SAF-T-LOCK

MODEL: W-81; W-80; W-80E

PATENT NO.: 4,062,209 (U.S.)

SUGGESTED RETAIL PRICE (1981): $65 - $220 (U.S.)



DESCRIPTION AND OPERATION:

The system consists of two floor-mounted posts fitted with U-shaped brackets. The U-shaped bracket is laterally adjustable for various wheelchair widths. The chair is backed in and secured when the pins are manually or automatically locked across the rims. Three methods of release are: manual; semi-automatic, by pressing a lever; or automatic, by pressing a control button. The control button may be remotely located if desired.

SPECIFICATIONS:
Manual: 35.5 cm (14") high
Semi-automatic and automatic: 31.7 cm (12 1/2") high
Lateral adjustment, all models: 20.3 cm (8")
Shipping weight, manual: 6.8 kg (15 lb)
semi-automatic: 9 kg (20 lb)
automatic: 11 kg (25 lb)

INSTALLATION:
. the post is fastened to the vehicle floor with four (3/8") bolts

REMARKS:
i) . attendant operated
ii) . user or attendant operated
iii) . user operated

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE:
i) Driver framelock
ii) Standard framelock
iii) LOW'R-N-LOCK

OPERATION: i) Automatic ii) Automatic iii) Automatic

MANUFACTURER:
Creative Controls Inc.
1354-I Combermere
Troy, MI
U.S.A. 48084
Tel: (313) 585-0985

REPRESENTATIVE: Thomas R. Stowers, Manager

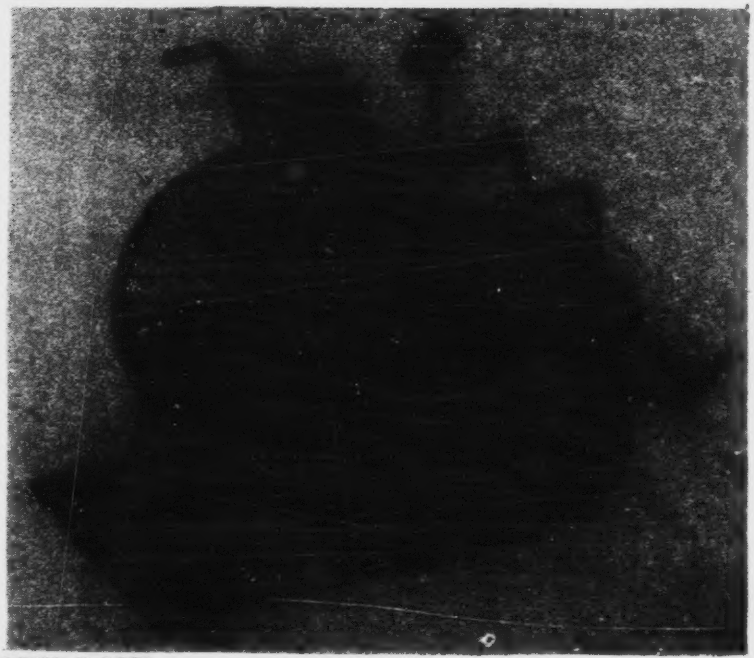
TRADE NAME: iii) LOW'R-N-LOCK

MODEL:
Platform hardware and controls:
i) 1000 ii) 2000-S iii) 3000-L

Wheelchair hardware:
i) 1111 ii) 2001-S iii) 3111-L

PATENT NO.: Pending

SUGGESTED RETAIL
PRICE (1981):



LOW'R-N-LOCK

DESCRIPTION AND OPERATION:

All three systems consist of two basic parts:

- steel restraint platform with hardware, 12-volt DC heavy duty actuator, switches and wiring;
- two wheelchair safety triangles, two restraint rods, hardware and lap belt.

The driver restraint assembly includes floor troughs; the standard restraint assembly includes wheel stops; LOW'R-N-LOCK includes lowering mechanism for wheelchair.

i) When the chair is positioned over the restraint platform with the large wheels in the floor troughs, activation of the system lowers the chair 7.6 cm (3") and sequentially engages the bar-grips directly to the adaptive hardware on the chair. Driver application.

ii) When the chair is positioned over the restraint platform with the two large wheels in the special wheel stops, activation of the system restrains the chair by means of the adaptive hardware. The safety triangles on the chair provide the structure for attachment of the lap belt and the chair's adaptive hardware. Passenger or driver application.

iii) When the wheelchair is positioned over the restraint platform, against the stops, activation of the system initially takes the weight off the wheels to permit them to be disengaged and pivoted up so that the framework of the chair can be lowered 10 cm (4"). Activation of the second switch causes the mechanism to lock on the front and rear restraint rods, while the chair moves forward to the driving position. The system operates in reverse to unlock and raise the chair. Driver application.

SPECIFICATIONS: Contact manufacturer for design specifications.

INSTALLATION:
i) vehicle modification required to install floor troughs
ii) and iii) unit bolts to vehicle floor

REMARKS:

- all systems user operated
- all systems require adaptive wheelchair hardware
- all systems fit most manual and powered wheelchairs
- tested by University of Michigan, Highway Safety Research Institute

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE: Belt and track

OPERATION: Manual

MANUFACTURER: Crow River Industries, Inc.
1415 East Wayzata Blvd.
Wayzata, MN
U.S.A. 55391
Tel: (612) 475-2786

REPRESENTATIVE: Con Brown

TRADE NAME: Crow River Securement System

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): $119 (U.S.) per set

DESCRIPTION AND OPERATION:

The system consists of three or four heavy duty restraining belts, a floor-mounted track in appropriate configuration and a seat belt. Front securement belts are fitted with tension-retaining cam buckles and wide wire hooks and keepers, which fit over the caster arches of the chair. Over-the-centre tensioning buckles are used on the rear belts. On the three-point system, the rear belt is attached to the cross brace of the chair. On the four-point system, the rear belts are attached to the back posts of the chair. Belts may be removed from the tracks when not in use. A set of seat belts is attached in the same manner as the restraining belts, from centre-floor track to person in wheelchair.

SPECIFICATIONS:	Belts have a minimum tie-down strength of 1,136 kg (2,500 lb)
INSTALLATION:	. desired lengths of lock-down track are bolted to the vehicle floor
REMARKS:	. attendant operated . occupant secured independently of wheelchair . adapts to most wheelchair models . permits flexibility in chair location . may be mounted for forward or lateral chair position . permits use of all existing bench seats

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE:
i) Rim pin
ii) Anchor rod
iii) Chair lock for driver

OPERATION: i) Manual ii) Manual iii) Automatic

MANUFACTURER:
Drive-Master Corporation
16 Andrews Drive
West Paterson, NJ
U.S.A. 07424
Tel: (201) 785-2204

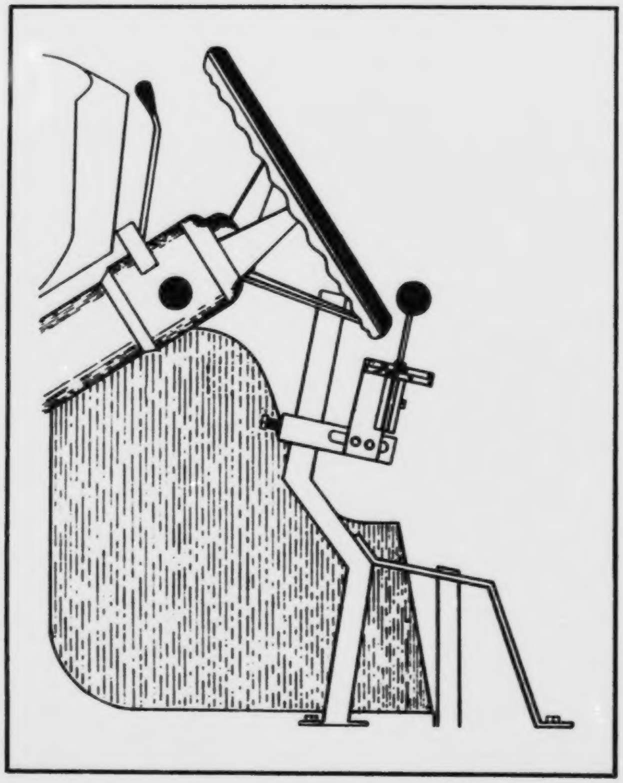
REPRESENTATIVE: Alan Ruprecht, President

TRADE NAME:

MODEL: i) V-3B ii) V-3A iii) V-12A

PATENT NO:

SUGGESTED RETAIL PRICE (1981): i) $185 (U.S.) ii) $60 (U.S.) iii) $175 (U.S.)



DESCRIPTION AND OPERATION:

i) The system consists of a frame that has two U-shaped brackets and lever-operated pins. When the chair is backed in, operation of the lever engages the pins across the wheel rims.

ii) The system consists of an adjustable linkage, hooked on both ends, with a tensioning lever. One end attaches to the cross brace of the chair and the other to a floor-mounted ring. Pulling up the lever exerts tension and pushing down releases it. This unit may also be wall mounted for clamping to the side of the wheelchair.

iii) The system consists of an adjustable cam lock device mounted on a floor-fixed post structure at the driving position. The mechanism automatically locks onto the forward post of the chair. Release is lever operated.

SPECIFICATIONS:

INSTALLATION:

REMARKS:
i) . attendant operated
ii) . attendant operated
iii) . user operated, driver application

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE: Four-point system with power pan

OPERATION: Automatic

MANUFACTURER: Dynamic Mobilities, Inc.
P.O. Box 1493
2070 Helena Street
Madison, WI
U.S.A. 53704
Tel: (608) 251-2882

REPRESENTATIVE: Don R. Warren, President

TRADE NAME:

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):

DESCRIPTION AND OPERATION:

SPECIFICATIONS:

INSTALLATION:

REMARKS:
- user operated
- driver application

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE: Three-point belt

OPERATION: Manual

MANUFACTURER: Electro Van Lift, Inc.
140 Concord, Near Robert St.
St. Paul, MN
U.S.A. 55107
Tel: (612) 298-0721

REPRESENTATIVE: Vern Warke, President

TRADE NAME:

MODEL: WCTD

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): $120 (U.S.)
$39.95 (U.S.) installation

DESCRIPTION AND OPERATION:

This three-point belt securement system consists of three belts to secure the wheelchair and a lap and torso belt assembly to restrain the wheelchair occupant. Three floor rings are fitted flush with the vehicle floor.

Two belts attach the front posts of the chair to the floor rings on either side of the chair. The third belt, with ratchet tensioning, attaches the cross brace of the chair to the central floor ring. The lap and torso restraint belt uses the two outer floor rings and an upper attachment point on the vehicle.

SPECIFICATIONS:

INSTALLATION:

REMARKS:

- attendant operated
- accommodates most wheelchairs
- automatic chair lock available for driver application

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE: T-bar

OPERATION: Manual

MANUFACTURER: Fred Scott & Sons
1444 W. Rand Road
Des Plaines, IL
U.S.A. 60016
Tel: (312) 297-1603

REPRESENTATIVE: John H. Fowler

TRADE NAME: TRANSLOCK

MODEL:

PATENT NO.:

SUGGESTED RETAIL
PRICE (1981):

DESCRIPTION AND OPERATION:

The system consists of a horizontal bar spanning the lower members of the chair, and a central anchor rod secured to the vehicle floor. The chair is secured by tightening the wing nut on the anchor rod, which causes the horizontal bar to exert pressure on the bottom rails of the chair. A pelvic seat belt is fixed to the vehicle floor behind the chair.

SPECIFICATIONS:

INSTALLATION:

REMARKS:	. attendant operated . pelvic seat belt supplied

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE:
i) Rod and hook
ii) T-bar
iii) Chair lock for driver

OPERATION: i) Manual ii) Manual iii) Automatic

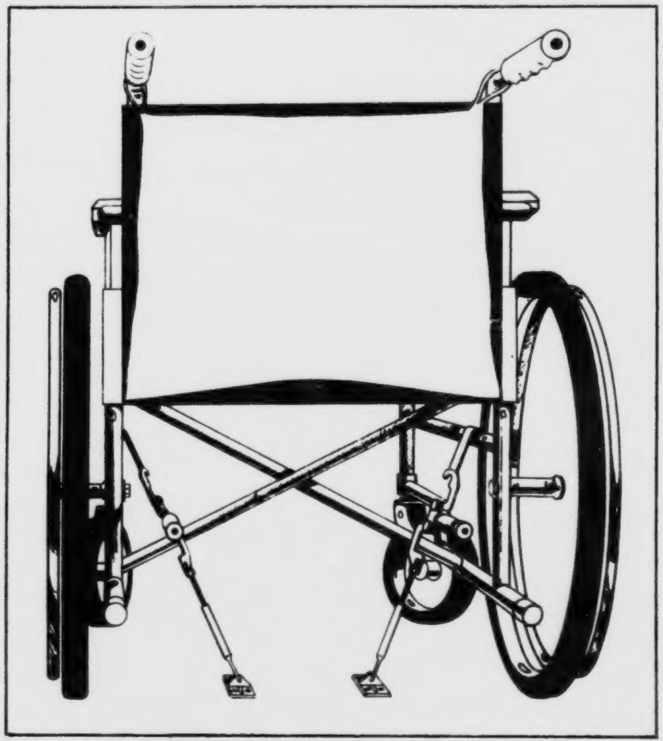
MANUFACTURER:
Gresham Driving Aids, Inc.
P.O. Box 405
30800 Wixom Rd.,
Wixom, MI
U.S.A. 48096
Tel: (313) 624-1533

REPRESENTATIVE: Gerald Gresham, President

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):
i) $100 (U.S.) pair
ii) $65 (U.S.) with chest belt
iii) $225 (U.S.)



Rod and hook

DESCRIPTION AND OPERATION:

The system consists of a horizontal bar spanning the lower members of the chair, and a central anchor rod secured to the vehicle floor. The chair is secured by tightening the wing nut on the anchor rod, which causes the horizontal bar to exert pressure on the bottom rails of the chair. A pelvic seat belt is fixed to the vehicle floor behind the chair.

SPECIFICATIONS:

INSTALLATION:

REMARKS:
- attendant operated
- pelvic seat belt supplied

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE:
i) Rod and hook
ii) T-bar
iii) Chair lock for driver

OPERATION: i) Manual ii) Manual iii) Automatic

MANUFACTURER:
Gresham Driving Aids, Inc.
P.O. Box 405
30800 Wixom Rd.,
Wixom, MI
U.S.A. 48096
Tel: (313) 624-1533

REPRESENTATIVE: Gerald Gresham, President

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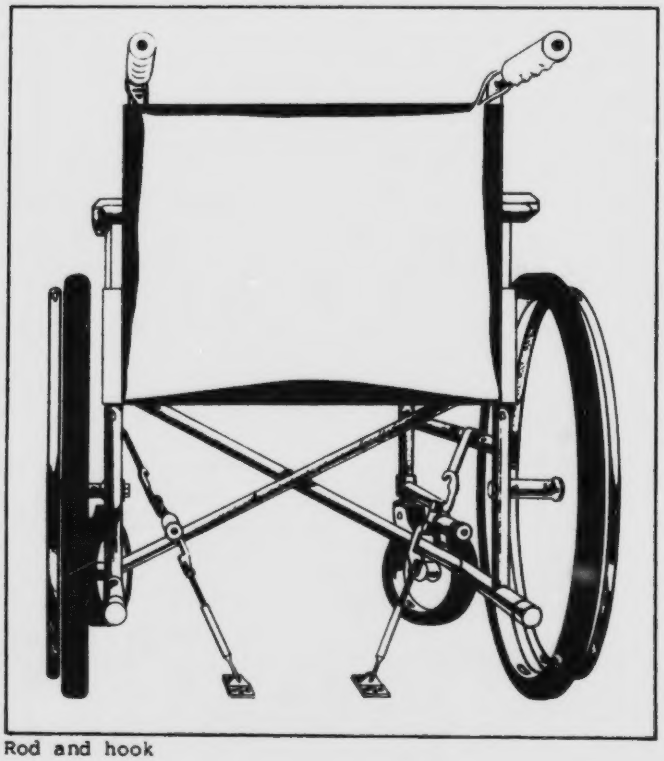

Rod and hook

DESCRIPTION AND OPERATION:

The system consists of a horizontal bar spanning the lower members of the chair, and a central anchor rod secured to the vehicle floor. The chair is secured by tightening the wing nut on the anchor rod, which causes the horizontal bar to exert pressure on the bottom rails of the chair. A pelvic seat belt is fixed to the vehicle floor behind the chair.

SPECIFICATIONS:

INSTALLATION:

REMARKS:

. attendant operated
. pelvic seat belt supplied

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE:
- i) Rod and hook
- ii) T-bar
- iii) Chair lock for driver

OPERATION: i) Manual ii) Manual iii) Automatic

MANUFACTURER:
Gresham Driving Aids, Inc.
P.O. Box 405
30800 Wixom Rd.,
Wixom, MI
U.S.A. 48096
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REPRESENTATIVE: Gerald Gresham, President

MODEL:

PATENT NO.:

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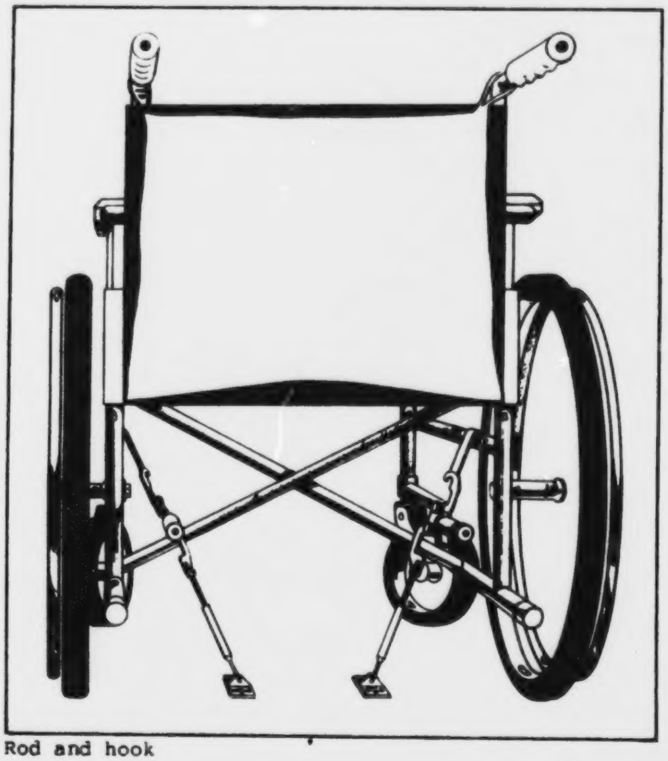


Rod and hook

DESCRIPTION AND OPERATION:

i) The system consists of a custom-fitted steel hook and rod assembly. The floor anchor fittings are installed accordingly. Points of attachment to the wheelchair are top rail or side frame spacers, or the assembly can be hooked over the top of the wheel.

ii) The system consists of a fixed-length horizontal bar and a central anchor rod that attaches to a floor plate. The bar should be located just 5 cm (2") forward of the back posts. A wing nut tightens the system to secure the chair.

iii) The system consists of an electric screwjack that operates a lever. One end of the lever is pinned to a post. The other end has an L-shaped extension that clamps down on top of the tire when the screwjack, which is pinned near this end, is contracted. Wheel wells are used in conjunction with this system.

SPECIFICATIONS:

INSTALLATION:

REMARKS:
i) . user or attendant operated
ii) . attendant operated
iii) . user operated, driver application

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE: Belt and bracket

OPERATION: Manual

MANUFACTURER: Handicaps Inc.
4335 S. Santa Fe Dr.
Denver, CO
U.S.A. 80110
Tel: (303) 781-2062

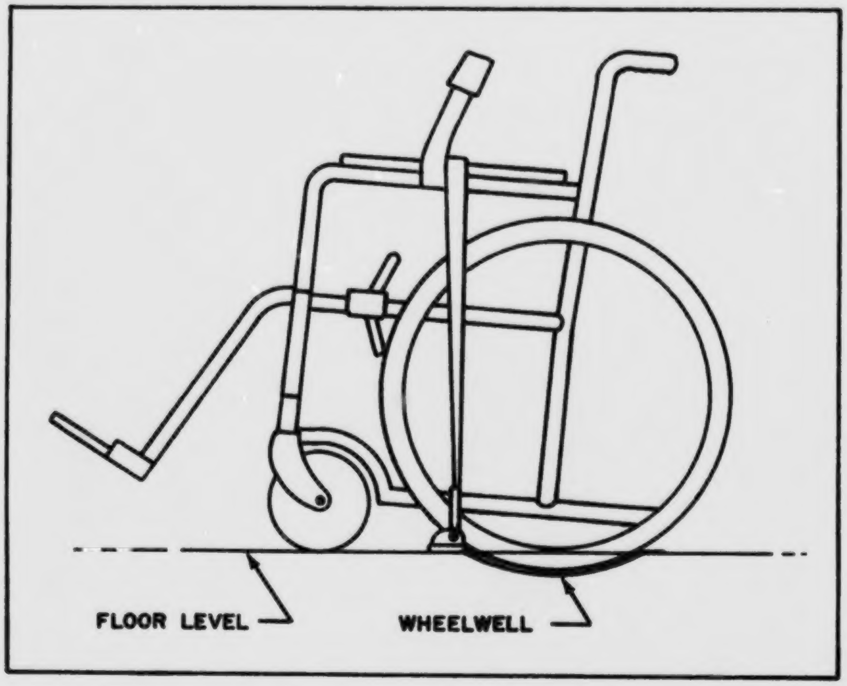
REPRESENTATIVE: Geraldine O'Dell, Sales Manager

TRADE NAME:

MODEL:

PATENT NO.:

SUGGESTED RETAIL
PRICE (1981):



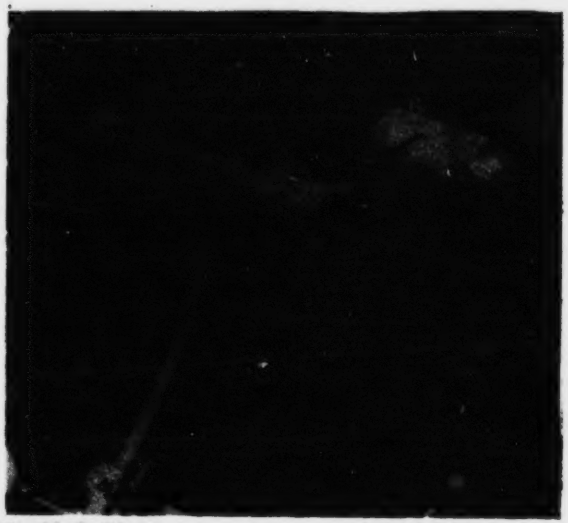
DESCRIPTION AND OPERATION:

The system consists of two automotive type seat belts and brackets. The brackets are bolted to the van floor. The belts are looped, one on each side, around the arm rests of the wheelchair, across the passenger's lap, and buckled.

For forward-facing travel, the installation of wheel wells is recommended. For lateral-facing travel, the belt assembly is used in conjunction with a floor-mounted V-shaped angle iron. The large wheels of the chair are behind this device so they have contact with the van wall, floor and angle iron.

SPECIFICATIONS:	Belt: 254 cm long (100") Wheel well: 13 cm x 31.7 cm (5 3/8" x 12 1/2")
INSTALLATION:	. Position chair, mark and cut wheel well openings . Caulk between floor and wheel well lip
REMARKS:	. user or attendant operated . meets U.S. federal regulations

EQUIPMENT:	**WHEELCHAIR SECUREMENT**
TYPE:	i) Belt and bracket ii) Rim pin iii) Frame anchor
OPERATION:	i) Manual ii) Manual iii) Manual
MANUFACTURER:	Handi-Ramp Inc. P.O. Box 745 1414 Armour Blvd. Mundelein, IL U.S.A. 60060 Tel: (312) 566-5861
REPRESENTATIVE:	Chris Lovdahl
TRADE NAME:	i) HC Belt & Bracket ii) Handi * Clamp iii) HC Standard Clamp
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	i) $49.95 (U.S) ii) $55 (U.S.) iii) $35.50 (U.S.)



Handi * Clamp

DESCRIPTION AND OPERATION:

i) The system consists of a bracket, mounted to the floor or wall of the vehicle, and an automotive type seat belt, which secures both the user and the wheelchair.

ii) The system consists of two heavy duty brackets with pin closures, which can be mounted on the wall or floor of the vehicle. The pins are clamped manually across the wheel rims to secure the chair.

iii) The system consists of a frame clamp and one-point attachment to the floor by an eye bolt ring.

SPECIFICATIONS:
i) Bracket: 152.4 cm long (60")
Belt: 203.2 cm long (80")
ii) Clamps: 8.9 cm x 26.7 cm (3 ½" x 10 ½")
iii) Wheelchair frame bracket: 38 cm (15") or 45.7 cm (18")

INSTALLATION:
. simple 1/4" bolts

REMARKS:
i) . attendant operated
ii) . attendant operated
. pinned width sufficient to accommodate most chairs widths
iii) . attendant operated
. fits all chairs of standard widths

EQUIPMENT: WHEELCHAIR RESTRAINT

TYPE: T-bar

OPERATION: Manual

MANUFACTURER: Mobility Dynamics Inc.
21029 Itasca Avenue
Chatsworth, CA
U.S.A. 91311
Tel: (213) 998-1026

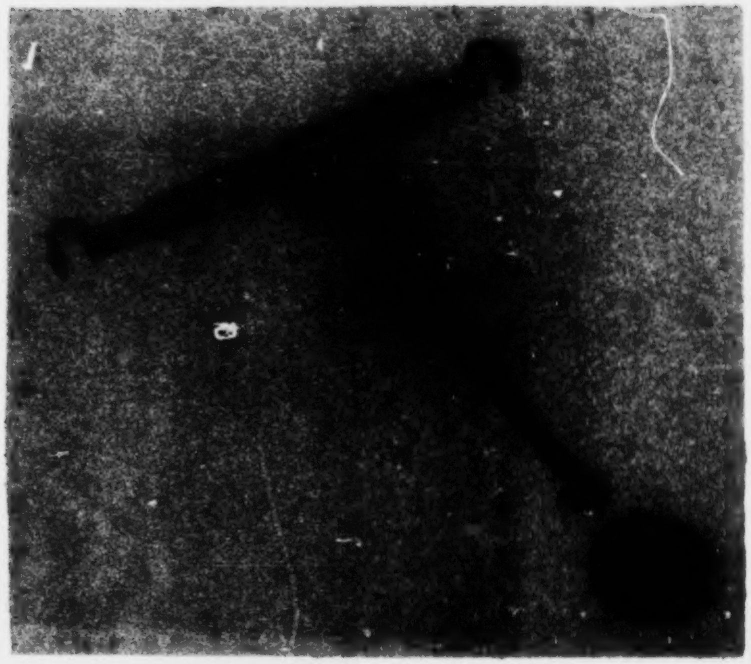
REPRESENTATIVE: Gene Shaffer

TRADE NAME:

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):



DESCRIPTION AND OPERATION:

The system consists of an adjustable metal bar with two end hooks and a central anchor rod that hooks between the cross bar and a floor ring. The bar spans the bottom rails of the chair, fore or aft of the cross brace. Operating the over-the-centre tensing device on the anchor rod secures the chair.

SPECIFICATIONS:

INSTALLATION:

REMARKS:

- attendant operated
- adjusts to fit most wheelchair models
- seat belt or equivalent must be used in conjunction with this system

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE:
i) T-bar
ii) Chair lock for driver

OPERATION: i) Manual ii) Automatic

MANUFACTURER:
Para Industries (1978) Ltd
74 Jamie Street
Nepean, Ont.
Canada K2E 6T6
Tel: (613) 226-5506

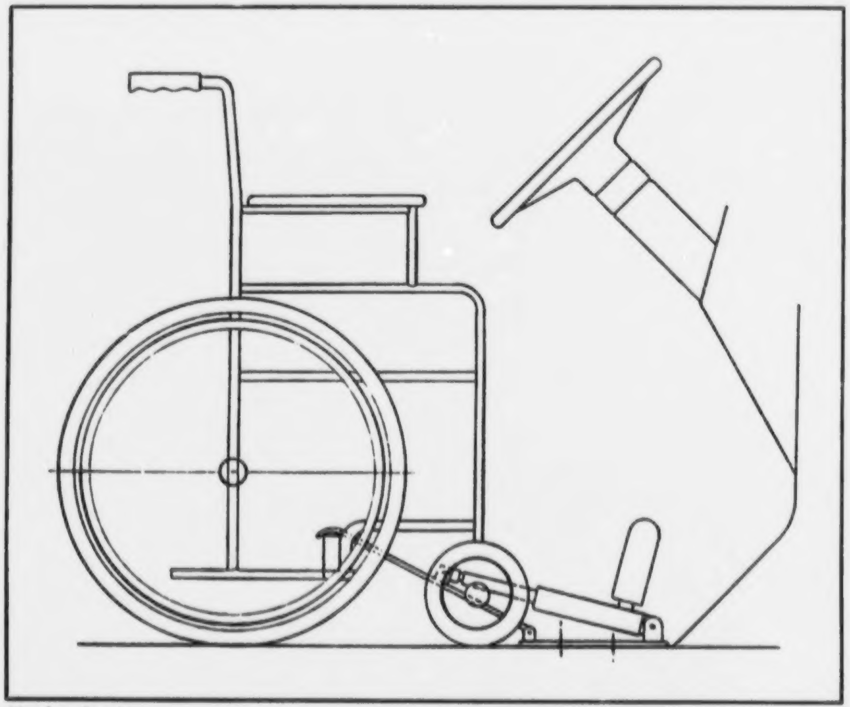
REPRESENTATIVE: Bob Moran, President

TRADE NAME:

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):



Chair lock

DESCRIPTION AND OPERATION:

i) This wheelchair restraint is a manual T-bar with an adjustable fore and aft positioning device. The latter device is a sliding toggle clamp to which the bolt holding the bar is attached. When the desired fore or aft position is selected, depressing the lever that actuates the toggle clamp locks the device in place. The securement bar clamps down on the bottom rail by means of a wing nut.

ii) This wheelchair restraint is simply a pivoted lever with a curled end that exerts a downward force on a cross bar mounted across the bottom rails of the wheelchair. The downward force is provided by a motor-driven two-way hydraulic cylinder, pivoted on top near the midpoint of the lever and on the base plate to which the pivoted end of the lever is also attached.

SPECIFICATIONS: ii) Power source: 12-volt electric motor driving a 300-psi hydraulic pump
Control: Dash-mounted double pole, double toggle switch

INSTALLATION:
- i) . skid plate with the toggle clamp track is mounted on the floor using four (3/8") bolts and a backing plate under the floor.
- ii) . base plate of the mechanism is mounted on the floor directly below the centre line of the steering column. The fore and aft position varies with the vehicle model and the preference of the driver as to the location of the wheelchair relative to the steering wheel. Two (3/8") bolts are used to secure the base plate to the floor.

REMARKS:
- i) . attendant operated
- ii) . user operated
- . adaptive hadware must be attached to the wheelchair

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE: Stemlock clamp and/or strap assembly

OPERATION: Manual

MANUFACTURER:
Rootes Maidstone Ltd.
Mill St.
Maidstone, Kent
England
Tel: Maidstone 53333

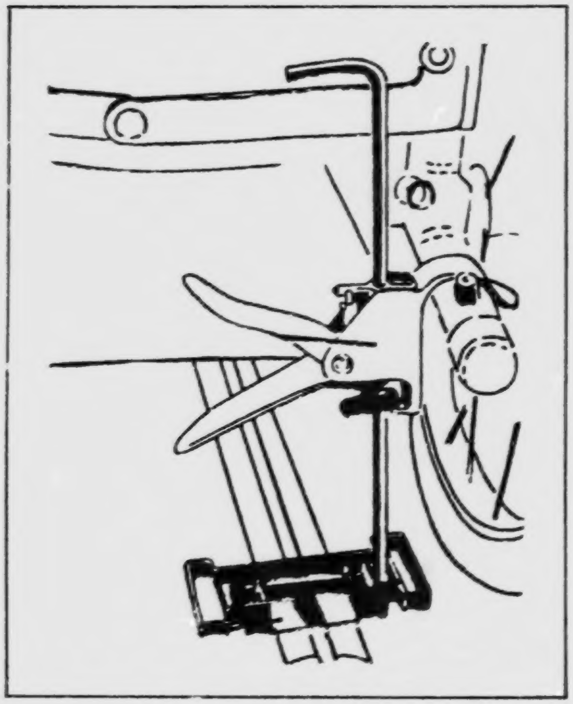
REPRESENTATIVE: T.E. Sankey

TRADE NAME: Rootes MK IV Wheelchair Clamp and Rootes Wheelchair Retaining Strap Assembly

MODEL:

PATENT NO.: Pending

SUGGESTED RETAIL PRICE (1981): Wheelchair clamp: £20; Wheelchair retaining strap: £13
Width adjuster: £21.50; Aluminium floor channel: £6/set



DESCRIPTION AND OPERATION.

The system consists of a metal ratchet with an adjustable clamp, aluminium floor channels an optional width adjuster that can only be used at the rear positon and a wheelchair restraining strap assembly. The foot of the ratchet is inserted in the floor channel or the width adjuster, and turned clockwise. Lowering the clamp onto the bottom rail by operating the ratchet secures the wheelchair. Two clamps, positioned diagonally opposite each another, must be used to secure the wheelchair.

Alternatively two wheelchair restraining strap assemblies can be used or one strap assembly with one clamp (the clamp always positioned at the rear). The hooked end of the strap is designed to engage any suitable part of the wheelchair frame or axle, and the scissor action anchorage on the other end fits into the aluminium floor channel. A quick action release hook and loop buckle provides positive adjustment and release.

SPECIFICATIONS:

Clamp: galvanized coated steel
Width adjuster: plastic coated steel
Strap assembly: black nylon webbing strap and galvanized coated steel hook, buckle and anchorage
Aluminium channel: B.S. HE30WP aluminium alloy

INSTALLATION:

. aluminium channel recessed into floor covering and secured by 1/4" bolts, washers and nuts

REMARKS:

. attendant operated
. lap and torso restraint required

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE: Cable and hook

OPERATION: Manual

MANUFACTURER: Saskatchewan Council for Crippled Children & Adults
1410 Kilburn Avenue
Saskatoon, Sask.
Canada S7M 0J8
Tel: (306) 653-1694

REPRESENTATIVE: John Jackson

TRADE NAME:

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): Combination seat $174; installed $207
Seat frame (no upholstery) $92.50
Prices subject to change

DESCRIPTION AND OPERATION:

This system consists of a combination flip-seat structure and a cable-operated chair-holding hook. When the seat is flipped up and the wheelchair positioned, operation of a lever behind the seat structure raises the chair-holding hook to engage the cross brace of the chair.

SPECIFICATIONS:

INSTALLATION:

REMARKS: . attendant operated

EQUIPMENT:	WHEELCHAIR SECUREMENT
TYPE:	T-bar
OPERATION:	Manual
MANUFACTURER:	Skillcraft Industries, Inc. 1270 Ogden Road Venice, FL U.S.A. 33595 Tel: (813) 488-1501
REPRESENTATIVE:	Lee Huston, President
TRADE NAME:	
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	

DESCRIPTION AND OPERATION:

The system consists of an extendable horizontal bar with frame clamps at each end, and a central threaded anchor rod that hooks into a floor fitting. The bar spans the lower frame members of the chair and clamps over the bottom rails. Tightening the wing nut on the central rod secures the chair.

SPECIFICATIONS:

INSTALLATION:

REMARKS: . attendant operated

EQUIPMENT: WHEELCHAIR SECUREMENT

TYPE:

OPERATION:

MANUFACTURER:
Target Industries Inc.
55 Newberry Road
Warehouse Point, CT
U.S.A. 06088
Tel: (203) 627-9329

REPRESENTATIVE: David Crand, President

TRADE NAME: SPEEDYLOCK

MODEL:

PATENT NO.: Pending

SUGGESTED RETAIL PRICE (1981):

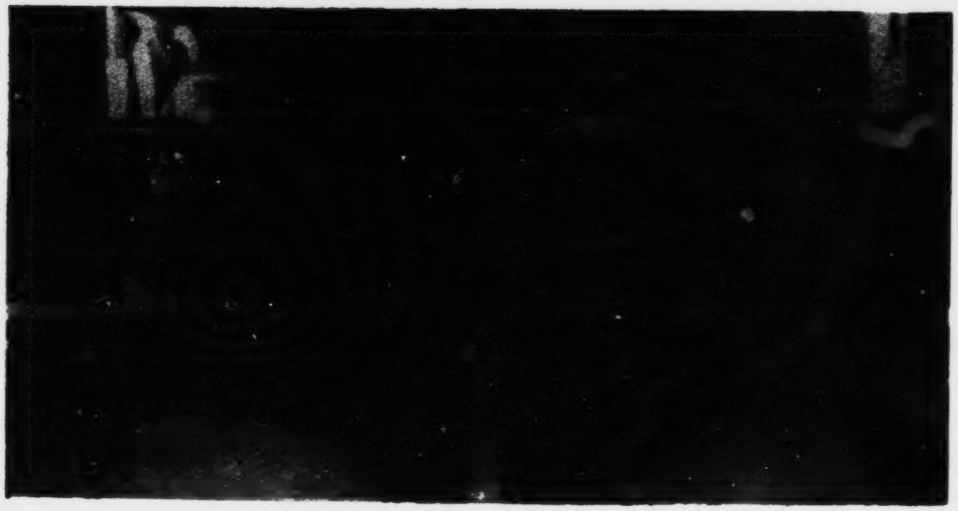
DESCRIPTION AND OPERATION:

SPECIFICATIONS:

INSTALLATION:

REMARKS:

EQUIPMENT:	**WHEELCHAIR SECUREMENT**
TYPE:	Rim clamp
OPERATION:	Automatic
MANUFACTURER:	Transi-Lift Equipment Corp. #105-1120 53rd Ave. N.E. Calgary, Alta. Canada T2E 6N9 Tel: (403) 275-8801
REPRESENTATIVE:	Gordon Samber, General Manager
TRADE NAME:	
MODEL:	
PATENT NO.:	Pending (U.S. and Canada)
SUGGESTED RETAIL PRICE (1981):	



DESCRIPTION AND OPERATION:

This system consists of a three-bar triangular structure that pivots about one of the bars. The other two guide bars each have a movable holding device connected to an independent, self-centering locking cylinder capable of extending 15 cm - 20 cm (6"-8") in each direction. These holding devices have tapered locking arm fingers that retract to clamp around the rims of the large wheels of the chair. These fingers allow for some adjustment to avoid hitting the wheel spokes. A retractable seat belt is mounted in tubes on either side of the system.

Once the wheelchair is backed up, so that both guide bars are against the wheels, the user operates a switch to cause the central holding devices to move outward until contact is established with the wheel rim.

SPECIFICATIONS:

Power source: 12 volt, 5 amp. supply for power solenoids
30-psi pneumatic supply

Dimensions: 7.6 cm long x 17.8 cm high x 20.3 cm wide
(3" x 7" x 8")

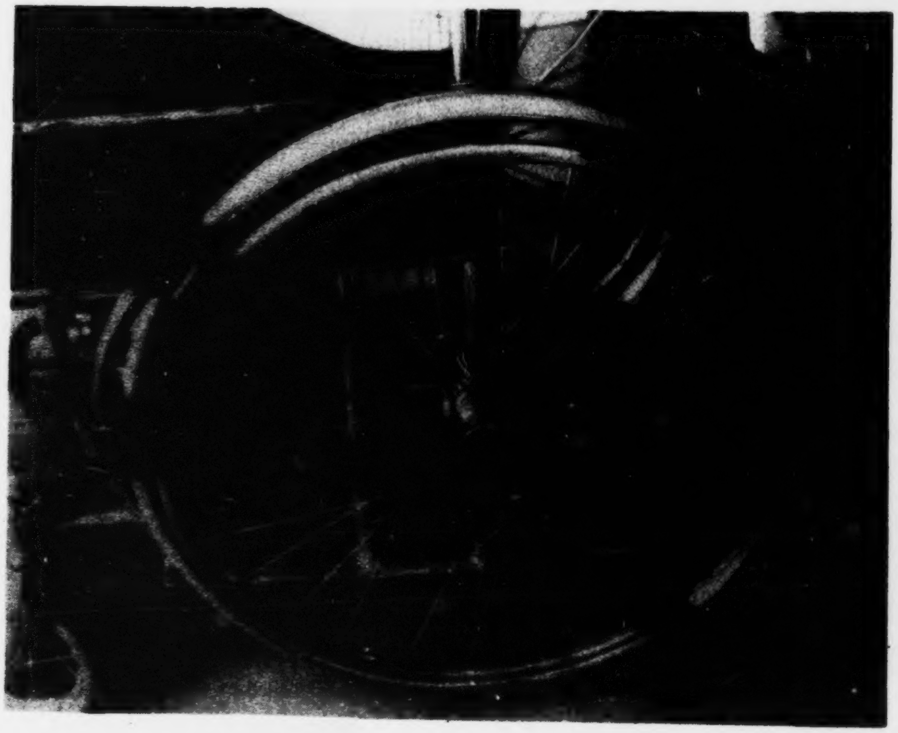
INSTALLATION:

- can be mounted on the vehicle floor, but is generally installed in conjunction with Octaco or American Seating flip-up seats

REMARKS:

- user operated
- driver activated
- cannot be used with solid rim wheels

EQUIPMENT:	WHEELCHAIR SECUREMENT
TYPE:	Securement arm
OPERATION:	Manual
MANUFACTURER:	Prototype designed and developed by Les Designers Douglas Ball, Inc., under contract to the Transportation Development Centre (TDC) 1000 Sherbrooke St. West P.O. Box 549, Place de l'aviation Montreal, Quebec Canada H3A 2R3 Tel: (514) 283-4072
REPRESENTATIVE:	Roy S. Nishizaki, TDC
TRADE NAME:	
MODEL:	Prototype wheelchair securement for rail car application
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	



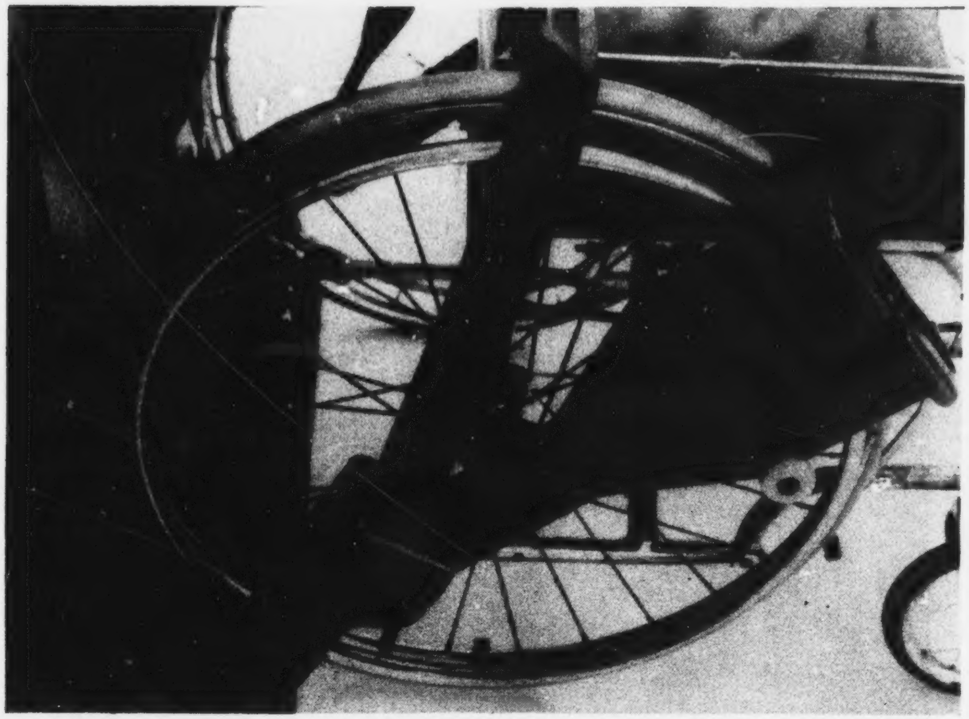
DESCRIPTION AND OPERATION:

The wheelchair securement system for rail car application consists of the main structure with a built-in back and head rest, seat belt and restraint arms. The restraint arms are deployed at about 45° and securement is by means of a hook placed over the wheel with a manual control lever exerting tension.

SPECIFICATIONS:

INSTALLATION:	. bolted to the floor and bulkhead of a rail car
REMARKS:	. user or attendant operated . capable of accepting most standard wheelchairs . restraint arms are adjustable for different whell diameters and chair widths

EQUIPMENT:	WHEELCHAIR SECUREMENT
TYPE:	Securement arm
OPERATION:	Manual
MANUFACTURER:	Prototype designed and developed by Les Designers Douglas Ball, Inc., under contract to the Transportation Development Centre (TDC) 1000 Sherbrooke St. West P.O. Box 549, Place de l'aviation Montreal, Quebec Canada H3A 2R3 Tel: (514) 283-4072
REPRESENTATIVE:	Roy S. Nishizaki, TDC
TRADE NAME:	
MODEL:	Prototype multi-modal wheelchair securement
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	



DESCRIPTION AND OPERATION:

This is a modular securement system consisting of: the triangular cross-section base to which over-the-tire restraint arms are attached, a lower back structure against which the wheels rest; an upper back structure containing the adjustable back and head rests; and an optional seat module. The seat belt can be used either as a lap belt or as a three-point belt to provide upper torso restraint.

The restraint arm is operated by first placing the control lever in the upper position to allow free movement in length for placing the hooked end over the tire of the large wheel. Lowering the manual control lever tensions the arm to secure the wheelchair.

SPECIFICATIONS:

INSTALLATION:	. recommended installation is front or rearward facing position against a bulkhead . bolts required on the floor and at shoulder level
REMARKS:	. user or attendant operated . capable of accepting most standard wheelchairs . restraint arms are adjustable for different wheel diameters and chair widths . all applications except aircraft . design elements may be used in various combinations to meet the requirements of different applications

III NON-CONVENTIONAL WHEELCHAIRS

The conventional wheelchair is available in various sizes and shapes, customized to the particular needs of the user. About 75% of wheelchairs fall into two categories:

- lightweight, foldable, manual type
- electrically powered versions of the manual chair

The remaining 25% of wheelchairs are power driven and non-foldable and vary greatly in size and shape. This portion of the market is increasing rapidly as new concepts in wheelchair design, special purpose attachments and modifications are developed and manufactured. Some features of the new designs are:

- curb- or stair-climbing capability
- all-terrain concept
- operating speeds as fast as 22 km/h (14 mph)
- increased manoeuvrability
- flexibility in outdoor/indoor use
- sporty styling
- three-wheelers.

Significant problems associated with transporting users of non-conventional wheelchairs are:

- lack of safe wheelchair securement/passenger restraint
- wheelchair lift capabilities
- positioning within the vehicle.

Developers and manufacturers of innovative systems are meeting the rising expectations of disabled persons for greater independence and mobility. The non-conventional wheelchairs covered in this section include:

- multi-purpose wheelchairs
- special purpose attachments and modifications to wheelchairs
- scooters
- tricycles
- wheelchair conveyances
- vehicle entry/exit units used in conjunction with specially designed wheelchairs.

NON-CONVENTIONAL WHEELCHAIRS

MANUFACTURER	TYPE						OPERATION		APPLICATION			REMARKS
	MULTI-PURPOSE	SCOOTER	TRICYCLE	ATTACHMENT	CONVEYANCE	ENTRY/EXIT UNIT	MANUAL	POWERED	OUTDOOR/INDOOR	INDOOR/OUTDOOR	OUTDOOR	
1. A & B ELECTRIC VEHICLES LTD.												
RANGER	X							X			X	
SCOOTA		X						X		X		Suitable for children 89 cm (35") turning radius
2. AMIGO SALES, INC.												
AMIGO		X						X		X		91.4 cm (36") turning radius
3. ARBEITSZENTRUM FÜR BEHINDERTE						X	X					Powered unit optional two door car application
4. BATRICAR LTD.												
BATRICAR	X							X			X	
BATRICHAIR	X							X	X			38 cm (15") shorter than Batricar
5. THE BRAUN CORPORATION												
T1000 TRI-WHEELER	X							X		X		76.2 cm (30") turning radius
6. BREARLEY, MAURICE N.				X			X			X		Stair-climbing prototype
7. BRIAN WAITE ENTERPRISES						X		X				Unit used in conjuction with specially designed wheelchair Pre-production phase
8. LES DESIGNERS DOUGLAS BALL INC.	X							X	X			Curb-climbing prototype
9. E.F. BREWER COMPANY												
PORTASCOOT		X						X		X		
10. GENERAL ENGINES CO.												
CYCLE CHAIR			X					X	X			Pedal models available Optional features allow conversion to conventional wheelchair

NON-CONVENTIONAL WHEELCHAIRS

MANUFACTURER	TYPE						OPERATION		APPLICATION			REMARKS
	MULTI-PURPOSE	SCOOTER	TRICYCLE	ATTACHMENT	CONVEYANCE	ENTRY/EXIT UNIT	MANUAL	POWERED	OUTDOOR INDOOR	INDOOR OUTDOOR	OUTDOOR	
11. LYONS, D.				X			X			X		Gear mechanism provides selection of ratios
12. MED-ORTHO DESIGN & MANUFACTURING LTD.												
CRUISER		X						X		X		
13. MIDON ENGINEERING PRODUCTS INC.												
MOBIE		X						X		X		
14. MOBILITY ENGINEERING & DEVELOPMENT, INC.	X							X	X			Specially designed to serve as vehicle seat
15. PALMER INDUSTRIES												
HAPPY WANDERER			X					X			X	
16. RICHISON, E.M.				X				X	X			Stair-climbing prototype
17. SAAB-SCANIA												
PERMOBIL SUPERIOR	X							X	X			
PERMOBIL EXTERIOR	X							X			X	
18. SHERRY PRODUCTS INC.												
ELEKTRA	X							X	X			99 cm (39") turning radius
19. TOMCO ENTERPRISES, INC. TRY-CYCLING					X			X			X	Means of operating a motorcycle from a wheelchair
20. TRAVELECTRIX (JERSEY) LTD.												
THE TRAVELLER	X							X	X			
21. TRI-AID TRIKES MANUFACTURING CO. LTD.												
TRI-AID			X				X				X	Children's models available

NON-CONVENTIONAL WHEELCHAIRS

MANUFACTURER	TYPE						OPERATION		APPLICATION			REMARKS
	MULTI PURPOSE	SCOOTER	TRICYCLE	ATTACHMENT	CONVEYANCE	ENTRY EXIT UNIT	MANUAL	POWERED	OUTDOOR INDOOR	INDOOR OUTDOOR	OUTDOOR	
22. UNICYCLE INC.				X			X				X	One-wheeled cycle type attachment
23. VESSA LTD.												
VESSA VITESSE				X				X		X		Attachments for curb climbing
24. VOYAGER, INC.												
VOYAGER II, IV and V	X							X	X			
25. WHITE, LES				X			X			X		Attachment allows conventional wheelchair to negotiate an escalator
26. WILGOT ÅHS INNOVATION AB						X		X				Unit used in conjunction with specially designed wheelchair Prototype in evaluation process

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Scooter

OPERATION: Powered

MANUFACTURER: A & B Electric Vehicles Ltd.
Belfont Trading Estate
Mucklow Hill
Halesowen, West Midlands,
England B62 8DR
Tel: 021 550 8118

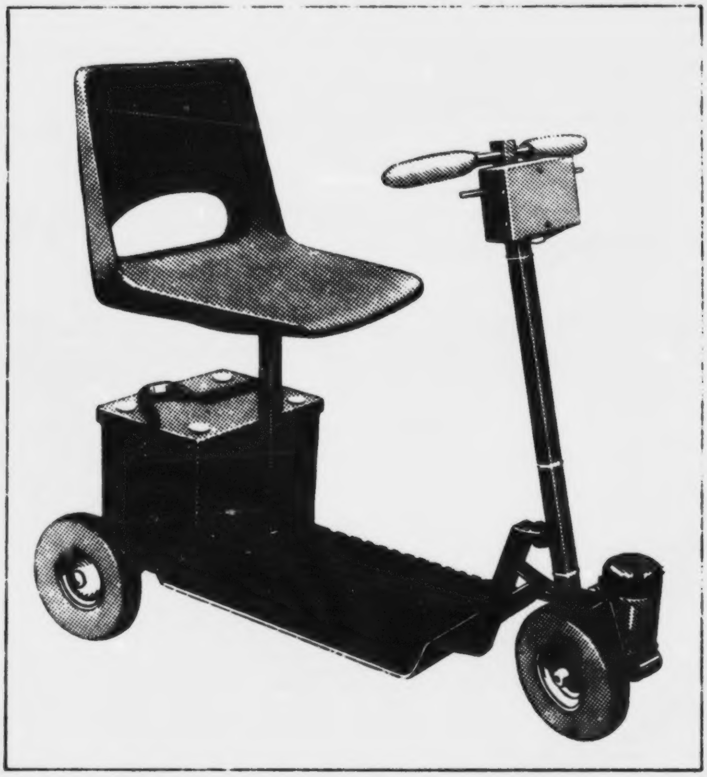
REPRESENTATIVE: Chris Biddle

TRADE NAME: Scoota

MODEL:

PATENT NO.:

SUGGESTED RETAIL
PRICE (1981):



DESCRIPTION:

This is an electric, three-wheeled scooter-type vehicle, capable of turning in a 89 cm (35") radius, for indoor/outdoor use. The vehicle consists of four modules: a platform with two puncture-proof rear wheels and integral motor with front wheel; the seat; the handlebar and control unit; and the battery pack. The vehicle can be dismantled without use of tools in 15 seconds. The swivel seat has 360° movement, height adjustable level and detachable arm rests.

The vehicle operates on a DC electric motor (located on the front wheel), powered by two 12-volt batteries (located in a box under the seat). A battery charger is provided.

Operating controls located on the steering handlebar consist of an on/off switch and a variable speed control lever. Electronic braking is automatic.

OPERATION:

The user transfers into the swivel seat, switches on, and presses the speed control lever to control forward and reverse speeds up to 6.4 km/h (4 mph).

SPECIFICATIONS:

Length: 98 cm (39 1/4")
Width: 57 cm (22 1/2")
Height: 89 cm (35")
Weight: 39 kg (86 lb) with batteries
Seat height from ground: 52 cm - 57 cm (20 1/2" - 22 1/2")
Maximum speed: 6.4 km/h (4 mph)
Maximum gradient climbed: 1:12
Range: 19 km (12 miles)

WARRANTY:

REMARKS:

- easily operated by children
- easily dismantled for storage

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Multi-purpose
OPERATION:	Powered
MANUFACTURER:	A & B Electric Vehicles Ltd. Belfont Trading Estate Mucklow Hill Halesowen, West Midlands, England B62 8DR Tel: 021 550 8118
REPRESENTATIVE:	Chris Biddle
TRADE NAME:	Ranger
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	

DESCRIPTION:

This is an all-purpose electric vehicle capable of travelling on rough terrain and negotiating a curb 15 cm (6") high. It is constructed of fibreglass on a steel chassis and features a unique articulated suspension with twin motor rear wheel drive and four pneumatic road tires 41 cm x 10 cm (16" x 4"). It has an adjustable upholstered seat, lift-up upholstered arm rests and a metal grab bar on each side. Two standard 12-volt batteries are located under the lift-up seat. The tilt-up tiller, located on either the left or right side of the vehicle, leaves the stepwell unobstructed. The control console is located on the tiller.

OPERATION:

The user transfers into the vehicle after tipping up the tiller and one of the arm rests, and switches the ignition key on the control console to "on". Operating a lever controls the vehicle's speed, and moving the tiller arm controls the direction. When the control lever is released, electronic braking slows the vehicle and a brake lever on the tiller arm acts as a stopping and parking brake.

An electric horn and a battery charger are standard equipment. Lights, basket, etc., are optional.

SPECIFICATIONS:

Overall length: 117 cm (46")
Overall width: 72 cm (28 1/2")
Overall height: 104 cm (41")
Seat height from footwell: 46 cm (18")
Seat height from ground: 57 cm (22 ½")
Wheel base: 71 cm (28")
Weight: 150 kg (330 lb)
Maximum forward & reverse speeds: 9.5 km/h (6 mph)
Maximum gradient climbed: 1:4 (25%)
Range: 19 km (12 miles)

WARRANTY:

REMARKS:

- user operated
- optional accessories available

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Scooter

OPERATION: Powered

MANUFACTURER: Amigo Sales Inc.
6693 Dixie Highway
Bridgeport, MI
U.S.A. 48722
Tel: (517) 777-0910
Telex: 810 265 0105

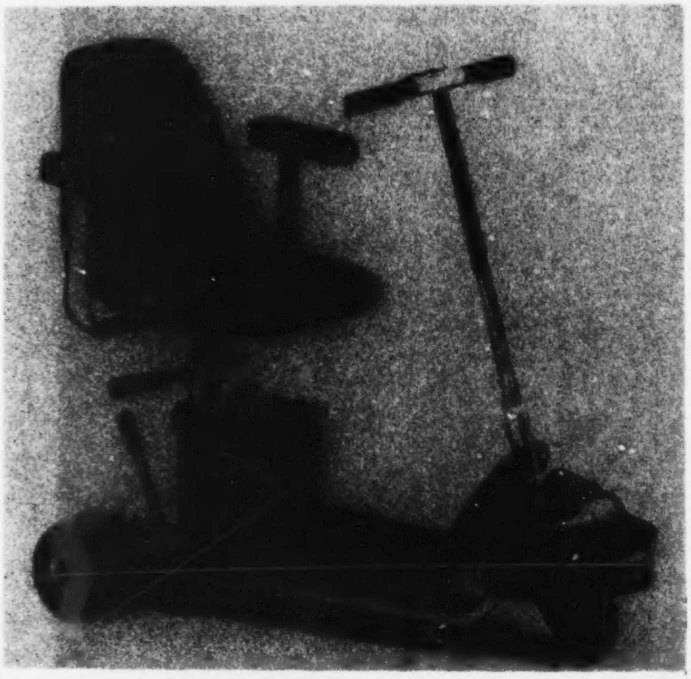
REPRESENTATIVE: Debbie Mills, International Sales

TRADE NAME: Amigo

MODEL: Amigo Stability

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): $1,198 (U.S.)



DESCRIPTION:

This is an electric, three-wheeled scooter-type vehicle for indoor/outdoor use, which turns in a 91.4 cm (36") radius. The Amigo is available in four standard models and three mini units for children. The easily dismantled vehicle consists of four modules: seat, steering handle, battery pack and platform base with drive head and three wheels. The platform is chrome-plated steel construction, with rear dual wheels and a bumper-protected drive head. The #103, 6.4 km/h (4 mph) drive head is recommended for most people.

The detachable, 360° swivel, upholstered seat features fixed arm rests and a manual seat lock to facilitate transfer.

The front-wheel drive vehicle runs on a single motor, powered by a 12-volt gel cell battery, which weighs 9.5 kg (21 lb). It is acceptable for airline travel. A battery charger is provided.

The thumb control forward/reverse speed control lever is located on the steering handle. When the lever is released automatic braking occurs. A manual brake lock lever, attached to either side of the platform, holds the vehicle for parking or transfer.

OPERATION:

When the seat is locked in suitable position, the user transfers into the scooter and operates the on/off switch. Forward and reverse direction and speed are controlled from the lever on the steering handlebar. Braking is automatic when the speed control lever is released. The parking brake is manually operated.

SPECIFICATIONS:

Length: 97.8 cm (38 1/2")
Width: 45 cm (17 3/4")
Height: 103.5 cm (40 3/4")
Weight: 24 kg (53 lb) less seat and battery
Seat height from ground: 47 cm - 54.6 cm (18 ½" - 21 ½")
Maximum speed: 6.4 km/h (4 mph)
Maximum gradient climbed:
Range:

WARRANTY:

- six months on parts and labour

REMARKS:

- vehicle may be customized to individual need
- easily stowed in four parts
- electric seat lift optional
- mini units have variable speed capability up to 4.8 km/h (3 mph)
- slower and faster drive heads optional
- Amigo BOOTS, an all-terrain outdoor carrier for the Amigo, is available

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Entry/exit unit
OPERATION:	Manual/Powered
MANUFACTURER:	Arbeitszentrum für Behinderte CH - 4802 Strengelbach, Switzerland Tel: 062/51 26 22
REPRESENTATIVE:	
TRADE NAME:	
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	$6,600 (Cdn.) approx.

DESCRIPTION:

This system, which consists of a manual or automatic entry/exit unit and a specially designed wheelchair, was developed to eliminate the necessity for transfer into a car seat. The system is suitable for installation in various two-door car models, for example: Austin 1100 and 1300, Simca 1100 and 1500, and VW Polo, and may be installed to replace the driver's or passenger's seat. The chair component of the system features an upholstered reclining seat; adjustable head, arm and foot rests; removable rear wheels [61 cm (24")] and retractable caster wheels [20.3 cm (8")], both with pneumatic tires.

The transfer mechanism features a chrome-plated linkage arm, powered by a hand operated hydraulic pump or an optional electro-hydraulic system.

OPERATION:

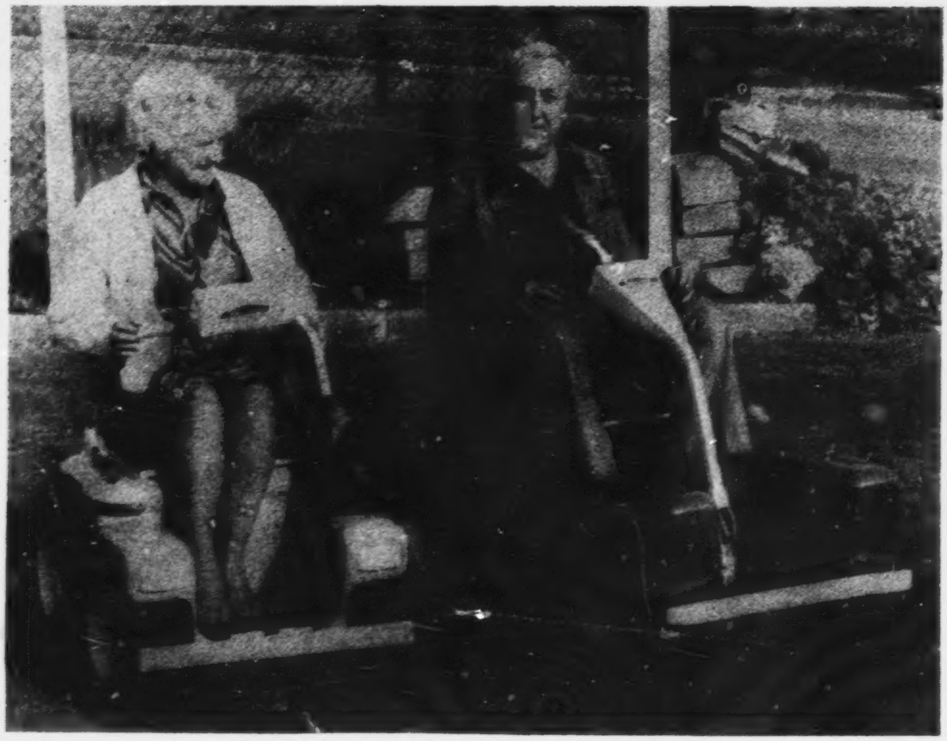
The wheelchair user comes alongside the car and manually or automatically activates the mechanism to extend the lifting arm and engage the pick-up points on the chair. The hydraulic pump is operated to partially lift the chair so that the rear wheels and foot rests can be detached and stowed in the vehicle. A hand lever is operated to retract the caster wheels. The chair then swings into the vehicle and lowers in driver or passenger position.

SPECIFICATIONS:

WARRANTY:

REMARKS:
- user or attendant operated
- driver or passenger application
- automatic operation optional
- 80 installations listed by manufacturer

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Multi-purpose
OPERATION:	Powered
MANUFACTURER:	Batricar Ltd. Griffin Mill Thrupp, Stroud, Glos. England GL5 2AZ Tel: Brimscombe (0453) 882243
REPRESENTATIVE:	K.B. McQueen
TRADE NAME:	i) Batricar ii) Batrichair
MODEL:	i) BC/4/18 ii) BC/S2
PATENT NO.:	Patented
SUGGESTED RETAIL PRICE (1981):	i) £995 ii) £945 £53 packing and F.O.B. charges



DESCRIPTION:

i) This four-wheeled, electrically driven, auto-styled vehicle is capable of negotiating curbs 102 mm (4") high and travelling on rough terrain. It features a fibreglass reinforced plastic body on a tubular chassis and four 356 mm x 76 mm (14" x 3") pneumatic tires. It has an upholstered seat and fold-up upholstered arm rests. Low voltage batteries under the seat provide operating power. A centrally located steering tiller supports a control box that contains the key switch, accelerator, forward/reverse switch and battery meter. Two-wheeled disc brakes on the rear wheels are provided.

ii) The Batrichair has the same features as the Batricar with the following exceptions:
. shorter length
. lighter weight
. tiller and controls located on left or right forward fender.

OPERATION:

The user transfers into the Batricar or Batrichair after raising one of the arm rests, and switches on the motor. The accelerator on the left and the forward/reverse switch on the right of the control box may be operated with one hand. Speed is variable forward or reverse. Downhill speed is controlled by releasing the accelerator and pressing down on the tiller, which applies the disc brakes.

SPECIFICATIONS: i) Length: 148 cm (58")
Width: 71 cm (28")
Height:
Seat height from footwell:
Seat height from ground: 56 cm (22")
Wheel base:
Weight: 110 kg (248 lb) with batteries
Maximum forward & reverse speeds: 6.4 km/h (4 mph)
Maximum gradient climbed: 1:4 (25%)
Range: 29 km (18 miles)

ii) Length: 109 cm (43")
Weight: 91 kg (200 lb) with batteries

WARRANTY: . one year on parts and labour

REMARKS:
. user operated
. attendant-controlled chair available
. accessories optional
. five colours available
. all-weather hood available

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Multi-purpose

OPERATION: Powered

MANUFACTURER: The Braun Corp.
1014 South Monticello
Winamac, IN
U.S.A. 46996
Tel: (219) 946-6157

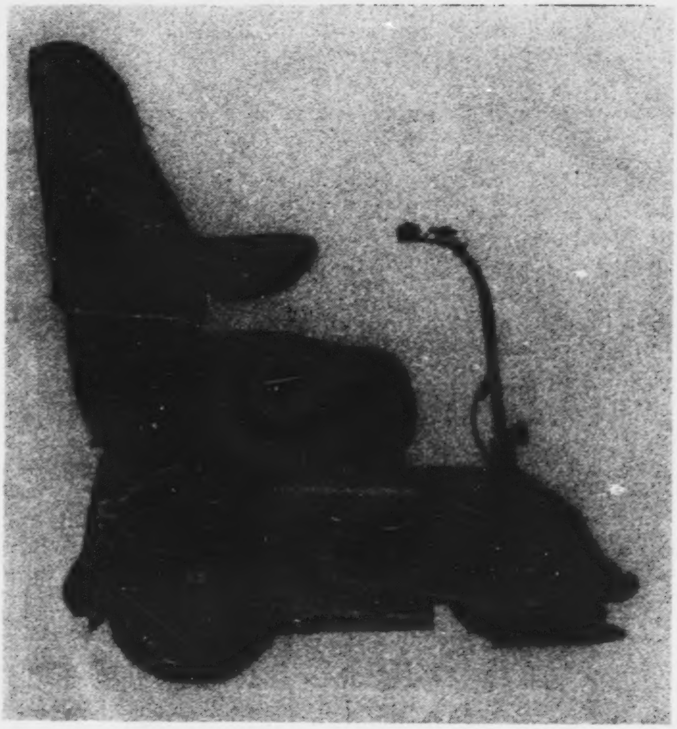
REPRESENTATIVE: Tom Bonnell

TRADE NAME: Tri-Wheeler

MODEL: T1000

PATENT NO.: None

SUGGESTED RETAIL PRICE (1981): $2,195 (U.S.)



DESCRIPTION:

This all-purpose, three-wheeled vehicle, capable of turning in a 76.2 cm (30") radius, is designed for indoor/outdoor use. It is constructed of fibreglass on a tubular steel frame and features wide pneumatic tires. It has a vinyl and upholstery fabric seat, with upholstered movable arm rests, which sits directly on the body of the vehicle. An optional vertical power seat is capable of being raised 15.2 cm (6"). The foot rests are located on either side of the centrally placed removable tiller, which supports the control console. Two standard group 24 batteries, located beneath the seat, power the vehicle.

OPERATION:

The user raises one of the arm rests and transfers into the vehicle. If necessary, the tiller may be removed to facilitate transfer. The vehicle, with variable speed forward or reverse, may be operated with one hand at the controls on the tiller.

SPECIFICATIONS:

Length: 97 cm (38")
Width: 64 cm (25")
Height: 91 cm (36")
Seat height from footwell: variable
Seat height from ground: 30 cm (12")
Wheel base: 57 cm (22 ½")
Weight: 90 kg (203 lb) with batteries
Maximum forward & reverse speeds: 7.2 km/h (4.5 mph)
Maximum gradient climbed: 30°
Range: 24 km (15 miles)

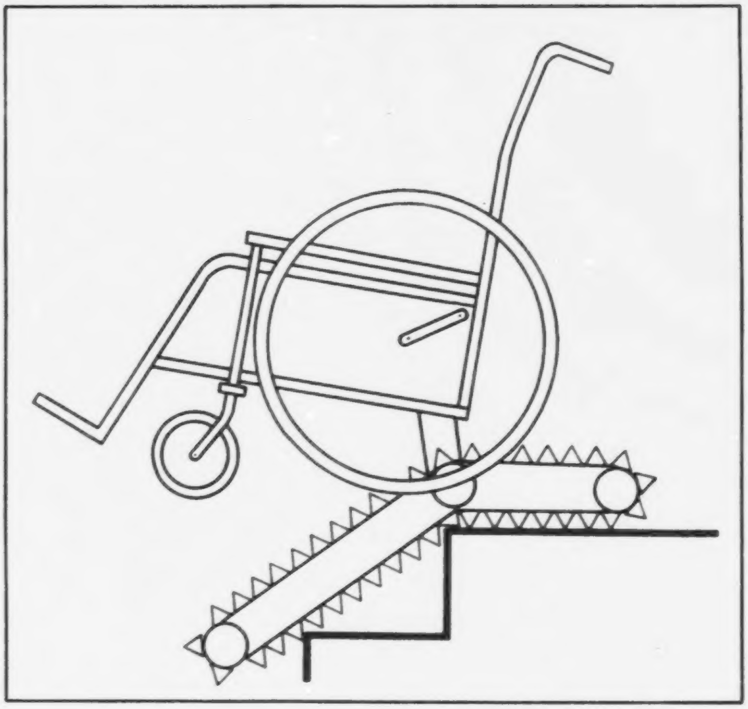
WARRANTY:

- one year on frame and fibreglass shell
- ninety days on electronic components
- six months on everything else

REMARKS:

- user operated
- battery charger and hookups are standard
- swivel seat/power seat optional

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Attachment to chair
OPERATION:	Manual
DEVELOPER:	Prototype developed by: Maurice N. Brearley Professor of Mathematics University of Melbourne Parkville, Victoria Australia 3052
REPRESENTATIVE:	Maurice N. Brearley
TRADE NAME:	
MODEL:	Prototype
PATENT NO.:	Patented
SUGGESTED RETAIL PRICE (1981):	



DESCRIPTION:

This is a collapsible, portable, manually operated wheelchair capable of ascending and descending straight stairs. The specially designed climbing attachments are mounted on each side of a conventional manual wheelchair with large wheels 61 cm (24") in diameter and caster wheels 17.8 cm (7") in diameter. Both attachments have a leading track and a trailing track, each with a pair of sprockets. The leading tracks are located laterally between the chair's large wheel and side frame. The trailing tracks are located just inside the chair frame. The tracks consist of roller chains with moulded plastic teeth providing a secure grip on the stairs. The tracks drive continuously around their sprockets to provide backward climbing and forward descent operation. When stairs are to be negotiated, the tracks are lowered and the main wheels are swung forward and lifted clear of the ground. Gear wheels on the main wheel hubs then engage with driving mechanisms, which enable the tracks to be driven by rotation of the main wheels. A hand crank lowers the tracks, engaging a worm wheel and reduction gear mechanism. When not in use, the crank is stored on the side of the chair. The two track systems work independently by separate drive mechanisms. An automatic brake, incorporated in the drive units, provides positive track locking whenever the main wheels of the chair are released, to prevent 'run away' while climbing.

OPERATION:

The user ascends the stairs by lowering the trailing tracks. During ascent, the user relocates the large wheels, pushing forward on their tops, or on the hand rims. The leading tracks are lowered prior to starting descent. Manual pressure on the wheels of the chair is reversed.

SPECIFICATIONS:

Length:
Width:
Height: 25 kg (55 lb) (estimate for a manufactured version)
Large wheel diameter: 61 cm (24")
Caster wheel diameter: 17.8 cm (7")
Inclination of leading track: between 45° and -5°
Inclination of trailing track: between 20° and -45°

WARRANTY:

REMARKS:

. to attain appropriate configuration for continuous operation on stairs, inclination of tracks must be set

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Entry/exit unit

OPERATION: Powered

MANUFACTURER: Brian Waite Enterprises
Lower Barn
Bodiam, East Sussex
England
Tel: Hawkhurst (05805) 3535

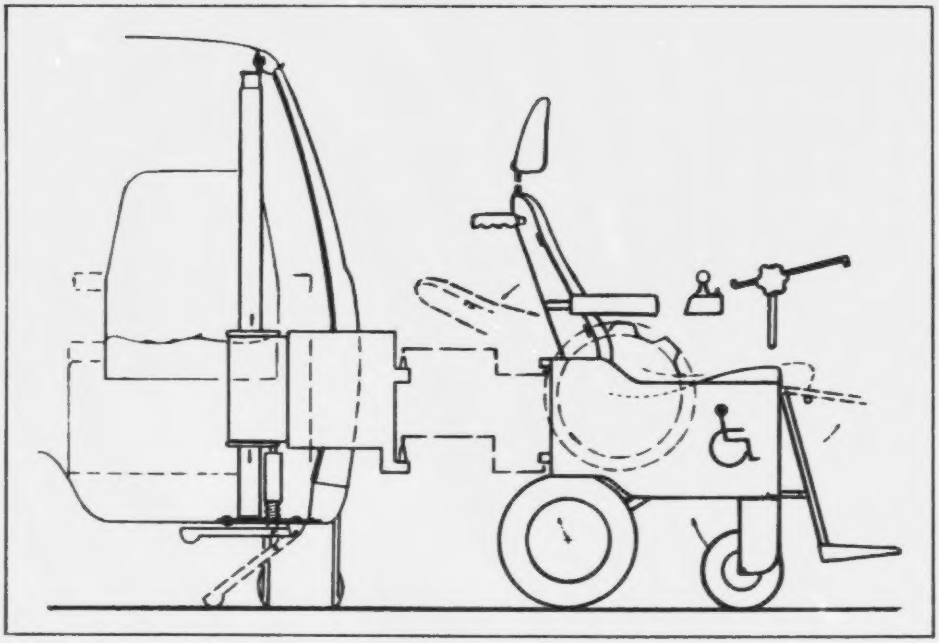
REPRESENTATIVE: Brian Waite

TRADE NAME:

MODEL:

PATENT NO.: 8,004,920

SUGGESTED RETAIL PRICE (1981): Basic push wheelchair and lift/transfer device £750 (ex works)
Basic powered wheelchair and lift/transfer device £1500 (ex works)



DESCRIPTION:

This system consists of an automatic lift/transfer mechanism, in conjunction with a specially designed wheelchair, which eliminates the need to transfer onto a car seat. The manual or powered chair, user- or attendant-driven, can fold into a compact shopping-cart configuration. Gel batteries avoid spillage. The chair, which is ergonomically designed, features reclining seat, flip-up desk arms, suspension, brakes that apply simultaneously to both rear wheels, and fittings to receive the lifting device. The lift/transfer mechanism is simply fitted, with little modification, to the car. It consists of a dual-pin, vertically located plate attached to a sliding tube by two plates that act as a parallel link mechanism. Thus the pins can be engaged on fittings attached to the wheelchair for lifting, and act as pivoting points for orienting the wheelchair in the forward direction. The parallel mechanism allows the wheelchair to move laterally into the vehicle. The sliding tube is mounted on a vertical post located inside the vehicle near the rear part of the front door opening. Lifting and lowering is accomplished by a hydraulic cylinder located between the vehicle floor and the sliding tube structure, or by an electro-mechanical linear actuator mounted within the post.

OPERATION:

The lifting device is lowered and the transfer mechanism extended. The wheelchair is reversed up to the open doorway and aligned so that the pick-up points on the lifting device locate into the chair. As the chair is lifted clear of the ground, all four wheels retract so that the chair is ready to be transferred into the car. The occupant faces outward during the first half of the transfer and is then rotated to face the front of the car while the chair is lowered and automatically locked into the normal seating position.

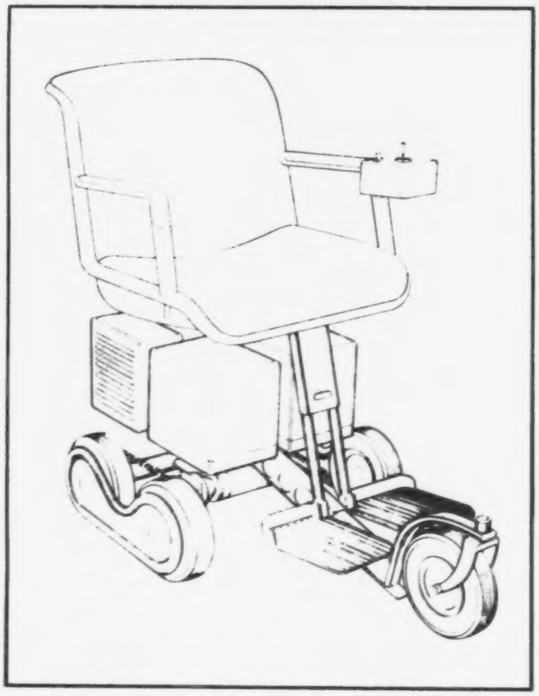
SPECIFICATIONS:

WARRANTY:

REMARKS:

- user or attendant operated
- driver or passenger application
- wheelchair replaces user's conventional chair for everyday use
- wheelchair seat is suitable for car travel

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Multi-purpose
OPERATION:	Powered
DEVELOPER:	Prototype designed and developed under contract to the Transportation Development Centre by Les Designers Douglas Ball Inc. 88 Ste Anne Street Ste Anne de Bellevue, Que. Canada H9X 1L8 Tel: (514) 457-9861
REPRESENTATIVE:	
TRADE NAME:	
MODEL:	Prototype
PATENT NO.:	4,119,163 (U.S.)
SUGGESTED RETAIL PRICE (1981):	



DESCRIPTION:

This is an all-purpose, four-wheel-drive, outdoor/indoor powered chair capable of negotiating 22 cm (9") curbs. The unit features a pivoting arm drive assembly, upholstered seat and arm rests and foldable metal foot rests. Each of the two pivoting arms has two 20.3 cm (8") wheels, with semi-pneumatic tires, interconnected by a chain drive. These arms, which pivot about the axle of one of the wheels, can be rotated to various positions by the electric motor. The forward caster wheel used for outdoor travel can be replaced by a smaller wheel, located behind the foot rest, for better indoor manoeuvrability.

Two standard electric motors powered by two 12-volt batteries, located under the seat, drive the wheelchair. A speed control box is located behind the batteries.

A standard electric wheelchair joystick, mounted on the left or right arm of the vehicle, controls operation. The switch controlling the pivoting arms is near the joystick.

OPERATION:

The joystick controls speed and direction and the switch controls the arms. To climb a curb, the user approaches it, and pivots the arm drive assembly forward to lift the front caster wheel from the ground. The chair is stopped with the rear wheels touching the curb. The arms are then pivoted backward, lifting the chair approximately 23 cm (9"). The user again drives up to the edge of the curb where the centre wheels then drive over it. The arm is pivoted forward again and the vehicle proceeds onto the upper level. Descending a curb requires rotating the arms backwards and sliding down. For steep inclines, the user enlarges the wheelbase of the unit by pivoting the arms backward. Occupants may also extend the reach, raising the chair 25 cm (10"), by first tilting the seat back and then pivoting the arms to the rear and down.

SPECIFICATIONS:

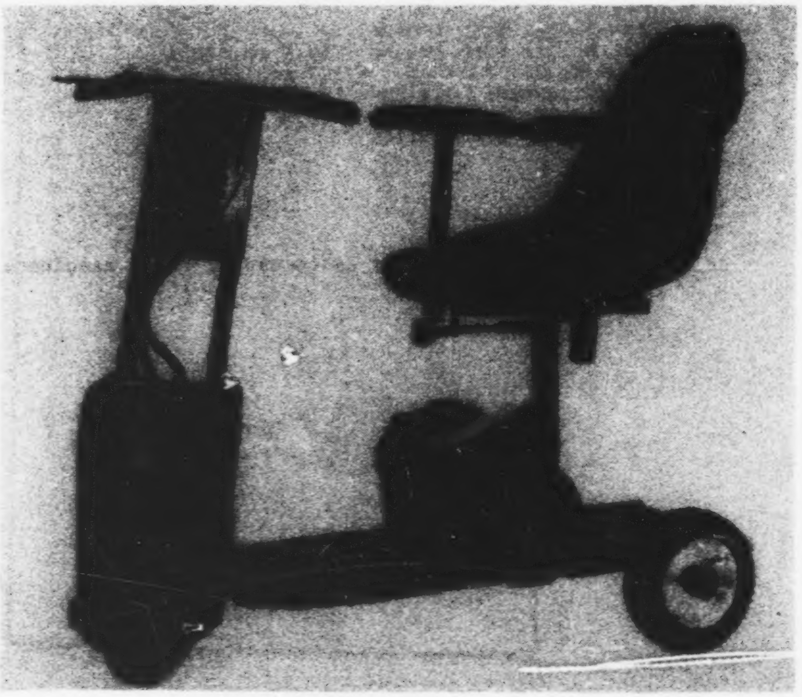
Length: 94 cm (37")
Width: 58 cm (23")
Height: 61 cm (24") without seat
Weight:
Seat height from footwell:
Seat height from ground: 50.8 cm (20")
Wheel base: 91.4 cm - 111.7 cm (36" - 44")
Maximum speed: 4.8 km/h (3 mph)
Maximum gradient climbed: 30%
Range: 16 km (10 miles)

WARRANTY:

REMARKS:

- portable in trunk of large car or small hatchback

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Scooter
OPERATION:	Powered
MANUFACTURER:	E.F. Brewer Company P.O. Box 159 Menomonee Falls, WI U.S.A. 53051 Tel: (414) 251-9530
REPRESENTATIVE:	
TRADE NAME:	Portascoot
MODEL:	i) #64050X-0 ii) #65000X-0
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	i) $778 (U.S.) ii) $943 (U.S.)



DESCRIPTION:

i) This is a battery-operated scooter, with semi-pneumatic wheels, for indoor/outdoor use. It is capable of turning in a 81.2 cm (32") radius and of operating on rough driveways and hard grass surfaces. It will negotiate a 10% gradient and will reverse, or zig-zag, up a steeper incline. It is constructed of a tubular chrome chair frame with a sling-type seat, which rests on an expanded metal platform. Arm rests are optional.

A 12-volt, deep cycle, U-1 style battery is secured in a fibreglass battery case on the platform in front of the rear wheels. The battery, which will last 200 cycles, must be charged after 5 hours of use.

Operating controls, for right or left hand, are located on the steering column and consist of a manual brake and parking lever and a press-down lever to activate the motor. There are three forward and three reverse speeds. A safety switch is provided for forward, reverse and off positions.

ii) This model has the same features as (i) with the exception that a cushioned adjustable swivel seat with arm rests locks in four positions with a spring-loaded pin and features five height adjustments in 2.54 cm (1") increments.

OPERATION:

The user controls three forward and three reverse speeds with right- or left-hand thumb or finger control. A hand-operated brake/parking lever provides braking action and parking safety.

SPECIFICATIONS:

i) Length: 109.2 cm (43")
Width: 58.4 cm (23")
Overall height: 85 cm (33 ½")
Wheel base: 81.2 cm (32")
Seat height from floor: 48.2 cm (19")
Seat height from frame: 34.2 cm (13 ½")
Weight: 25.4 kg (56 lb)
Forward & reverse speeds: 2, 3.2 and 5.6 km/h (1, 2 and 3.5 mph)
Maximum gradient climbed: 10%
Range:

ii) The same as for (i) with following exceptions:
Height: 85 cm - 95.2 cm (33 ½" - 37 ½")
Seat height from floor: 44.4 cm - 54.6 cm (17 ½" - 21 ½")
Seat height from frame: 30.4 cm - 40.6 cm (12" - 16")
Weight: 29.7 kg (65.5 lb)

WARRANTY:

- one year on parts and labour

REMARKS:

- user operated
- dismantles easily
- fits in most car trunks

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Tricycle
OPERATION:	Powered
MANUFACTURER:	General Engines Co. Electric Products Division 591 Mantua Blvd. Sewell, N.J. U.S.A. 08080 Tel: (609) 468-0270
REPRESENTATIVE:	Ed Repash
TRADE NAME:	Cycle Chair
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	$895 (U.S.)

DESCRIPTION:

This is a battery-operated, dual drive, three-wheeled vehicle suitable for outdoor/indoor use. The tubular aluminium frame is bicycle-like in appearance, and features three 50.8 cm (20") spoked wheels with urethane puncture proof tires and fenders. The vehicle has a contoured 360° swivel seat with locking lever, padded arm rests, an open platform and an elongated U-shaped steering handlebar. The centre of gravity is 12.7 cm (5") from the ground.

Two batteries, located underneath the seat at the rear of the platform, provide 24-volt power to the "Pedalpower" electric motors. The front-mounted motor drives the front wheel by a friction drive system. The rear-mounted motor drives the rear wheels by a differential drive system.

Operating controls, located on the steering handlebar, consist of an on/off key switch, a forward/reverse push button, a differential speed control lever and a brake lever that operates the front wheel drum brake.

OPERATION:

The user tilts the handlebar up, swivelling and locking the seat. The key switch is turned on, and forward or reverse direction selected. The motorcycle-type hand levers control speed and braking.

SPECIFICATIONS:

Length: 17.4 cm (68 1/2")
Width: 71 cm (28")
Height: 83.3 cm (34") to back of seat
Weight: 24.5 kg (54 lb) without batteries
Wheel base: 123 cm (48 1/2")
Seat height from ground: 61 cm (24")
Maximum outdoor speed: 22.4 km/h (14 mph)
Maximum indoor speed: 9.6 km/h (6 mph)
Maximum gradient climbed: 30°
Range: 24 km (15 miles)

WARRANTY:

REMARKS:

- user operated
- hand or foot pedal option
- optional features permit conversion to wheelchair

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Attachment

OPERATION: Manual

DEVELOPER: Prototype designed and developed with assistance from the Transportation Development Centre by
D. Lyons
1880 Daniel
Drummondville-Sud, Que.
Canada J2B 2A1
Tel: (819) 478-2289

REPRESENTATIVE: D. Lyons

TRADE NAME:

MODEL: Prototype

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):

DESCRIPTION:

This is a modified, standard manual indoor/outdoor wheelchair for use by persons with limited arm strength. The modifications consist of the replacement of the standard large wheels by smaller wheels, 32 cm (12 1/2") in diameter, which are driven by hand wheels, 30.4 cm (12") in diameter, through a bicycle type sprocket and chain mechanism. It is anticipated that, when developed, the wheelchair will have a gear mechanism to provide a selection of ratios for the occupant to use in turning the hand wheel.

OPERATION:

The user propels the chair by pushing on the hand wheels. In the prototype model the chain must be manually shifted on the sprockets to change the gear ratio.

SPECIFICATIONS:

Length }
Width } standard chair dimensions
Height }
Weight:
Large wheel diameter: 32 cm (12 1/2")
Caster wheel diameter: 15 cm (6")
Speed ratios: wheel speed/hand wheel speed approx.
1:3; 1:2; 1:1

WARRANTY:

REMARKS:

- may be operated by persons with limited arm strength
- rapid gear change permits ascent of steep slopes with reduced physical effort

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Scooter

OPERATION: Powered

MANUFACTURER: Med-Ortho Design & Manufacturing Ltd.
3206 Wharton Way
Mississauga, Ont.
Canada L4X 2C1
Tel: (416) 625-2605

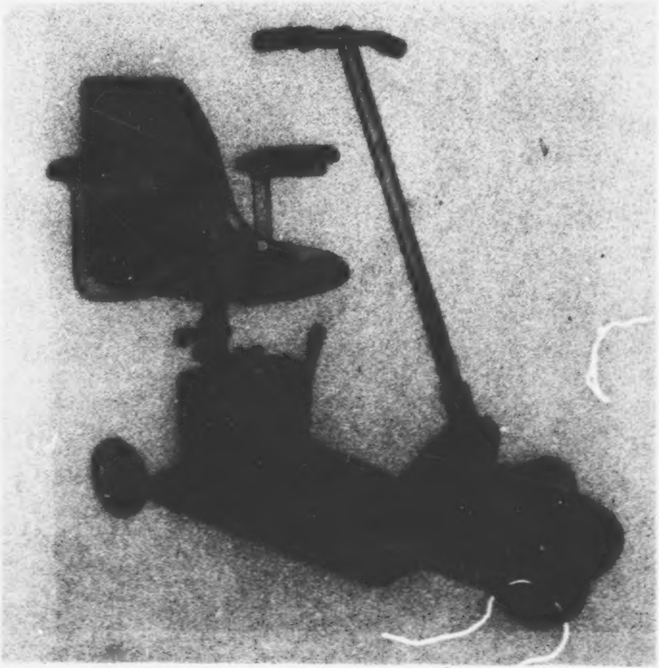
REPRESENTATIVE: C.E. Cardon
Tel: (416) 625-6217

TRADE NAME: Cruiser

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): $1,450 (Cdn.) F.O.B.



DESCRIPTION:

This is an electric, three-wheeled, scooter-type vehicle for indoor/outdoor use, capable of turning in a 91.4 cm (36") radius. The easily dismantled vehicle consists of four modules: platform base, seat, steering handle, and battery unit.

The platform is chrome plated steel construction with a bumper-protected front wheel drive unit and three non-marking, solid rubber wheels. Screw-on stability learning wheels are provided.

The detachable, adjustable seat, which can swivel at 360°, has retractable arms for easy transfer and is equipped with a seat lock.

An electric motor, powered by a 12-volt battery unit stored on the platform under the seat, runs the vehicle. One battery charge provides three to four hours of continuous operation. A battery charger is supplied.

The thumb control forward/reverse operating controls are located on the steering handle. There are two forward and two reverse speeds. Pressure on the spring-action, speed control bar to reverse the direction of travel provides braking action. A manual brake lever, located on the left or right side of the battery unit, operates the parking brake.

OPERATION:

The user locks the seat into position, raising one of the arm rests to facilitate transfer into the vehicle. Forward and reverse direction, speed and braking action are controlled from the steering handle.

SPECIFICATIONS:

Length: 91.4 cm (36")
Width: 45.7 cm (18")
Height:
Weight: 27.6 kg (61 lb) less battery
Seat height from ground:
Maximum speed:
Maximum gradient climbed: 1:12
Range:

WARRANTY:

. one year on parts and labour

REMARKS:

. easily stowed in four parts
. turns on its own axis

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Scooter
OPERATION:	Powered
MANUFACTURER:	Midon Engineering Products Inc. P.O. Box 1031 Kitchener, Ont. Canada N2G 4E3 Tel: (519) 579-6147
REPRESENTATIVE:	Michael Doman
TRADE NAME:	Mobie
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	$1,995 (Cdn.)

DESCRIPTION:

This is an electric, three-wheeled, scooter-type vehicle, with a 91.4 cm (36") turning radius, for indoor/outdoor use. The steel and fibreglass vehicle has a self-locking mechanism that allows easy dismantling into five modules: platform base, powerhead, seat, handlebar and battery unit. The platform, featuring dual rear wheels with telescoping rear axles, attaches to the bumper-protected powerhead, which houses the motor and a non-marking front drive wheel. The height-adjustable, detachable swivel seat features upholstered arm rests, removable seat cover and a chair lock.

Dual 24-volt get cell batteries, located on the platform under the seat, power the electric motor. An automatic battery charger is provided.

The thumb control forward/reverse speed control lever is located on the steering handlebar. Forward control has variable speeds, while reverse has single speed. Dynamic braking action is automatic. A locking parking brake is supplied.

OPERATION:

The user locks the seat in position for transfer. Handlebar controls govern forward and reverse direction, speed and braking action.

SPECIFICATIONS:

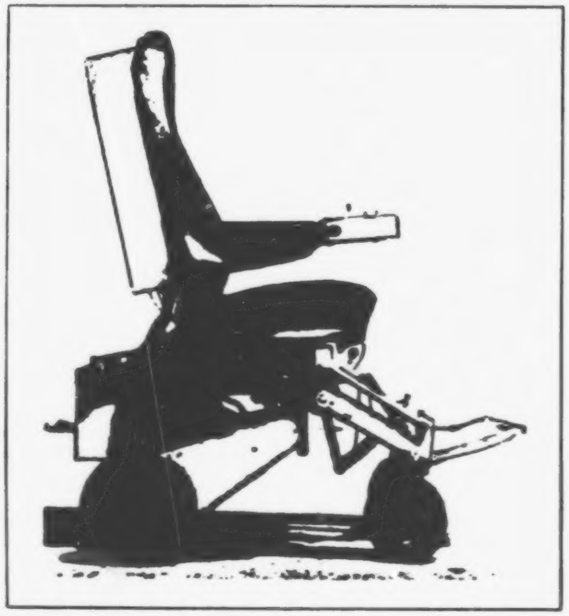
Length: 91.4 cm - 96.5 cm (36" - 38")
Width: 48.2 cm - 60.9 cm (19" - 24")
Height: adjustable
Weight: 25.4 kg (56 lb) less batteries
Seat height from ground:
Maximum speed:
Maximum gradient climbed:
Range:

WARRANTY:

REMARKS:

. easily dismantled for transportation

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Multi-purpose
OPERATION:	Powered
MANUFACTURER:	Mobility Engineering and Development Inc. 7131 Hayvenhurst Ave. Van Nuys, CA U.S.A. 91406 Tel: (213) 785-0958
REPRESENTATIVE:	Ron Prior
TRADE NAME:	Van Compatible Wheelchair
MODEL:	Model 3
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	$4,800 - $4,950 (U.S.)



DESCRIPTION:

The Model 3 van-compatible wheelchairs have been developed to serve the needs of the quadriplegic motor-vehicle driver. The unit is an all-purpose, four-wheel, outdoor/indoor electric wheelchair capable of travelling on rough terrain. The specially designed wheelchair features: height-adjustable upholstered seat; power reclinable back; integral head rest; articulated foot rest; and lap and shoulder seat belts. The seat-height control lengthens the variable wheelbase for outdoor stability and shortens it for indoor manoeuvrability. The arm rest control head assembly rotates out of the way to facilitate transfer.

Two 1/3 hp motors, powered by two 12-volt batteries, drive the rear wheels through a two-stage spur gear reduction drive.

The metal control head contains the directional and speed control switch that can be moved from full forward to full reverse. Acceleration and deceleration limiters smooth out jerky control switch motions. Positive high-speed steering results from proportional dynamic braking, even on hills and slopes. Power-steered versions are also being developed.

OPERATION:

This chair is completely automatic and quad-operated from the control head assembly. Once in the van and in driving position, the wheelchair is automatically locked down. Pressing a pushbutton switch mounted in the vehicle releases the chair.

SPECIFICATIONS:

Length: 116 cm - 128 cm (45 3/4" - 50 1/2")
Width: 65.4 cm (25 3/4")
Height: 125.7 cm - 152.4 cm (49 1/2" - 60")
Weight: 153 kg (337 lb)
Seat height from ground: 54.6 cm - 76 cm (21 1/2" - 30")
Wheel base: adjustable
Maximum speed: 13.6 km/h (8.5 mph)
Maximum gradient climbed: 18.5°
Range: 32 km (20 miles)

WARRANTY:

- six months

REMARKS:

- user operated
- wheelchair seat designed for use as a vehicle seat
- reflectors provided
- low-battery indicator provided

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Tricycle

OPERATION: Powered

MANUFACTURER: Palmer Industries
P.O. Box 707 Union Station
Endicott, N.Y.
U.S.A. 13760
Tel: (607) 754-1954

REPRESENTATIVE: Mildred Palmer

TRADE NAME: Happy Wanderer

MODEL: HW 100

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): $1,049 (U.S.)

DESCRIPTION:

This is a battery-powered, rear-wheel drive, outdoor tricycle with three 50.8 cm (20") pneumatic tires, capable of travelling on grass, dirt or gravel surfaces and of negotiating 7.6 cm (3") curbs and 15% gradients. This vehicle is bicycle-like in appearance, featuring a contoured seat with raised padded arm rests, U-shaped contoured handlebar, foot rest platform, chrome-fendered spoked wheels, large rear basket and sealed beam headlight and tail light. Safety reflectors on each wheel are standard. Front drum brakes provide safe parking, even on hills.

A 12-volt heavy-duty battery powers two permanent magnet motors, located in two fibreglass containers just in front of the rear wheels. A fully automatic, built-in battery charger (6 amp) is provided.

Operating controls consist of a keyed on/off switch, a throttle located on the handlebar to control speeds and a directional switch located on the side of the seat for forward, reverse and neutral positions. A pushbutton on the headlight operates the head and tail lights.

OPERATION:

The user pivots the steering bar away for access to the vehicle. When the on/off switch is turned "on", the directional switch is flipped to forward or reverse, and the throttle squeezed to control speed. The vehicle travels at a slow 4.8 km/h (3 mph) and cruises at 11.2 km/h (7 mph). Braking is automatic so that the vehicle stops when the throttle is released. Controls may be operated with one hand.

SPECIFICATIONS:

Length: 167.6 cm (66")
Width: 75 cm (29 1/2")
Height: 101.6 cm (40")
Weight: 68 kg (150 lb)
Seat height from footwell: 39.3 cm (15 1/2")
Seat height from ground: 57 cm (22 1/2")
Wheel base: 11.3 cm (44 1/2")
Maximum forward & reverse speed: 11.2 km/h (7 mph)
Maximum gradient climbed: 15%
Range: 24 - 32 km (15 - 20 miles)

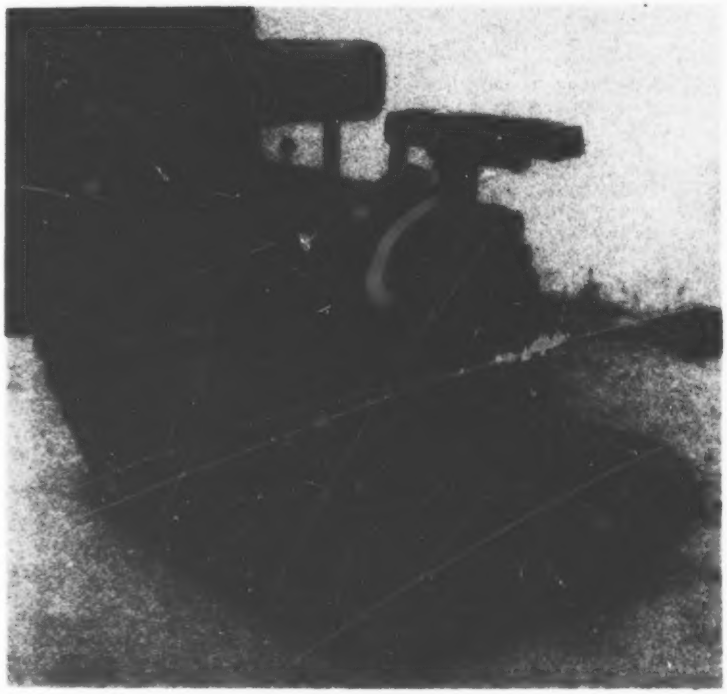
WARRANTY:

- one year on motors
- six months on all other parts

REMARKS:

- user operated
- high speed model for rough terrain available
- attachable electric kit available for any bicycle or tricycle

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Attachment to chair
OPERATION:	Powered
DEVELOPER:	Prototype developed by: E.M. Richison Kinta, OK U.S.A.
REPRESENTATIVE:	E.M. Richison
TRADE NAME:	
MODEL:	Prototype
PATENT NO.:	3,346,062 (U.S.)
SUGGESTED RETAIL PRICE (1981):	$1,000 (U.S.) approx.



DESCRIPTION:

This is an all-purpose, battery-powered outdoor/indoor vehicle capable of ascending and descending stairs, curbs and steep grades. The vehicle features a foam-padded reclining seat, padded arm rests, adjustable back rest and leg rests, attached to the main frame with the drive mechanism, which consists of two tracked tread belt systems. Each system includes a main tread component and a secondary inclined tread extending from the rear of the wheelchair. A switch automatically lowers and tilts the seat backward into a semi-reclining position, which shifts the centre of gravity back on the chair base to facilitate climbing. Descending takes place in the forward position and ascending in the reverse. The chair is moved through the two identical motor-driven tread systems, at the same speed, forward and reverse. Ascending and descending occur at a slower speed than operation "on the level". Braking the tracked drive system on one side or the other steers the vehicle. Two electric motors, powered by two 12-volt batteries, supply operating power. A battery charger is provided.

Operating controls consist of simple switches located on one of the vehicle arms.

OPERATION:

The user controls the wheelchair by operating the hand switches. One switch tilts the chair in preparation for climbing or descending, and a second switch controls forward and reverse speeds, as well as direction.

SPECIFICATIONS:

Length: 114.3 cm (45")
Width: 64.7 cm (25 1/2")
Weight: 84 kg (185 lb)
Maximum speed: speed of a slow walk

WARRANTY:

REMARKS:

. user operated
. models and blueprints available
. fits in most automobile trunks

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Multi-purpose

OPERATION: Powered

MANUFACTURER: SAAB-SCANIA
Fack S-551 01
Jönköping, Sweden

REPRESENTATIVE: Peter Isoz
SAAB-SCANIA of America Inc.
Saab Drive
Orange, CT
U.S.A. 06477
Tel: (203) 795-5671

TRADE NAME: Permobil

MODEL: i) Permobil Superior ii) Permobil Exterior

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): i) $19,250 (U.S.)

DESCRIPTION:

The Permobil series of electric wheelchairs, custom-fitted to individual user, are based upon two basic chassis configurations _ the Superior and the Exterior. The Permobil is capable of travelling over difficult terrain, including snow, and of negotiating 15.2 cm (6") curbs. It is also suitable for indoor use.

i) The Superior is designed for severely disabled users. It features six motors that control the positions of the upholstered seat and back rest as well as the foot rests. The entire side assembly with arm rests and leg rests can be detached or swung out. This four-wheel drive vehicle, featuring two large front wheels and two smaller rear wheels, has a turning radius of 127 cm (50"), power steering and four-wheel double system power brakes.

The battery unit and built-in charger are under the seat. Operating controls are available to suit the user's disability. Speed is continuous and adjustable.

ii) The Exterior model, primarily for outdoor use, has a low centre of gravity. It features two larger rear wheels and two smaller, adjustable front wheels. The length of the vehicle can be adjusted from the standard 134.6 cm (53") to plus 10 cm (4") or minus 15 cm (6"). The contoured upholstered seat can be raised 23 cm (9") and turned sideways for easy access.

The battery unit and built-in charger are located under the seat. Left- or right-hand operating controls are located on an accessible control box. Power brakes are provided. Three speeds are available for indoor use.

OPERATION:

Controls, which are customized to suit the user's capabilities, can be operated by hand, elbow, foot, chin or mouth. They include traditional joy-stick control, control panel with buttons located for foot control, and a chin bar with controls.

SPECIFICATIONS:

i) Length: 127 cm (50")
Width: 69 cm (27")
Height:
Weight:
Wheel base:
Maximum speed: 6.9 km/h (4.3 mph)
Maximum gradient climbed: 30%
Range: 28.8 km (18 miles)

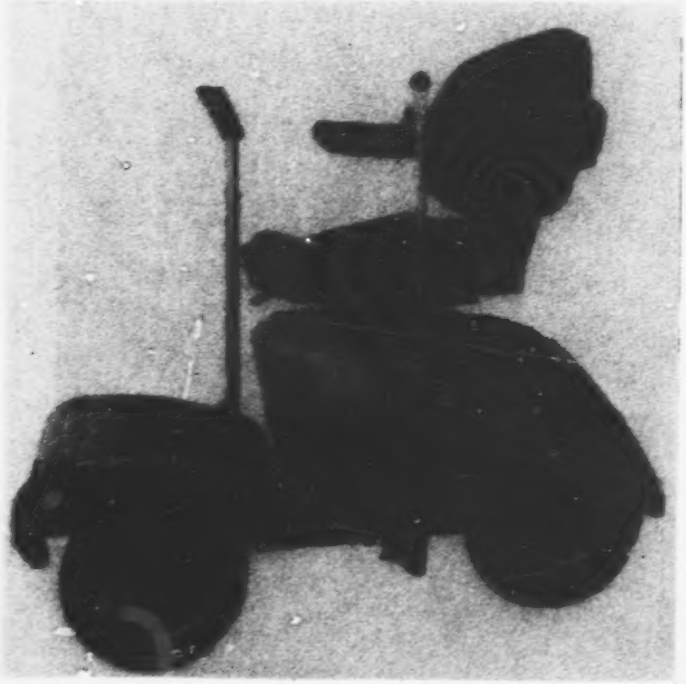
ii) Length: adjustable
Width: 69 cm (27")
Height:
Weight:
Wheel base: adjustable
Maximum speed: 15 km/h (9 mph)
Maximum gradient climbed: 30%
Range: 48 km (30 miles)

WARRANTY:

REMARKS:

- continuous adjustable speed
- double headlights standard
- easily adapted for special devices and fittings

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Multi-purpose vehicle
OPERATION:	Powered
MANUFACTURER:	Sherry Products Inc. 1501 Pacific Coast Hwy. Hermosa Beach, CA U.S.A. 90254 Tel: (213) 379-8457
REPRESENTATIVE:	Will N. Cargile, Marketing Manager
TRADE NAME:	Elektra
MODEL:	Elektra 850
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	$2,895 (U.S.)



DESCRIPTION:

This is an all-purpose, four-wheeled outdoor/indoor electric vehicle, capable of travelling over rough terrain and of turning in a 99 cm (39") radius. The upholstered vinyl seat, featuring low back lumbar support and swing-away upholstered arm rests, is suspended on the auto-type reinforced fibreglass body. The vehicle has front fenders, front and rear bumpers, an unobstructed stepwell, and four wide-profile pneumatic tires, about 36.8 cm (14 1/2") in diameter. It has standard rear wheel drum-type brakes and a choice of three brake operation systems _ hand, foot or dynamic.

Standard 6-volt batteries and twin DC motors are located under the seat, with a built-in automatic charger (30 amp) with retractable cord.

The steering tiller, located on one of the front fenders, supports a movable arm with a keyed on/off switch and an automatic eight-speed gear lever.

OPERATION:

The user transfers to the vehicle after raising one of the arm rests. Steering and speed control may be installed for left- or right-hand operation. Releasing the speed control performs automatic braking, or using a hand or foot brake lever performs manual braking.

SPECIFICATIONS:

Length: 99 cm (39")
Width: 71 cm (28")
Height: 89 cm (35")
Weight: 136.2 kg (300 lb)
Seat height from footwell: 33.6 cm (13 1/4")
Seat height from ground: 52 cm (20 1/2")
Wheel base: 63.5 cm (25")
Maximum speed: 28.8 km/h (18 mph)
Maximum gradient climbed: 40%
Range: 32 km - 40 km (20 - 25 miles)

WARRANTY:

REMARKS:

- user operated
- accessories optional
- vehicle has low centre of gravity

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Wheelchair conveyance
OPERATION:	Powered
MANUFACTURER:	Tomco Enterprises Inc. 7701 Hoover Road Valley Center, KS U.S.A. 67147 Tel: (316) 755-2269
REPRESENTATIVE:	Tom Terning, President Barney Hoss, Marketing Representative
TRADE NAME:	Try-Cycling
MODEL:	
PATENT NO.:	Pending
SUGGESTED RETAIL PRICE (1981):	$2,050 (U.S.) platform conversion $60 (U.S.) crating charge

DESCRIPTION:

This is a custom-designed platform sidecar for operating a motorcycle from a wheelchair. The platform, with modified steering, shock system and shifting mechanism, attaches to a 400 cc Honda Hawk Hondamatic with no alterations to the motorcycle.

The platform unit is steel construction with a fibreglass ferring front. It is equipped with dual brake controls, automotive type tye-rod steering, dual automotive safety belts with quick release and adjustable height. The third automotive type axle has a carrying capacity of 681 kg (1500 lb). The third wheel and platform are supported by a two shock spring absorber assembly with safety stop. The unit has outboard clearance lights and reflectors.

OPERATION:

The user wheels onto the platform in the chair and secures the safety belts. The motorcycle is operated using the standard handlebars and controls, which have been relocated to the platform sidecar.

SPECIFICATIONS:

Platform length: standard cycle length, less several centimetres for platform length
Platform width: standard cycle width, plus 101.6 cm (40") for platform
Platform weight: 68 kg (150 lb)
Shipping weight: 227 kg (500 lb)
Highway cruise speed: 88 km/h (55 mph)

WARRANTY:

- warranty of the motorcycle is not affected if an authorized motorcycle dealer carries out maintenance

REMARKS:

- user must have normal hand and arm strength
- when ordering, the operator's weight, the weight and width of the wheelchair and the distance to the floor from under the seated operator's arm must be specified
- no licensing difficulties

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Multi-purpose vehicle

OPERATION: Powered

MANUFACTURER: Travelectrix (Jersey) Limited
Route de la Haule
St. Brelade
Jersey, Channel Islands
Tel: (0534) 25301
Telex: 41161

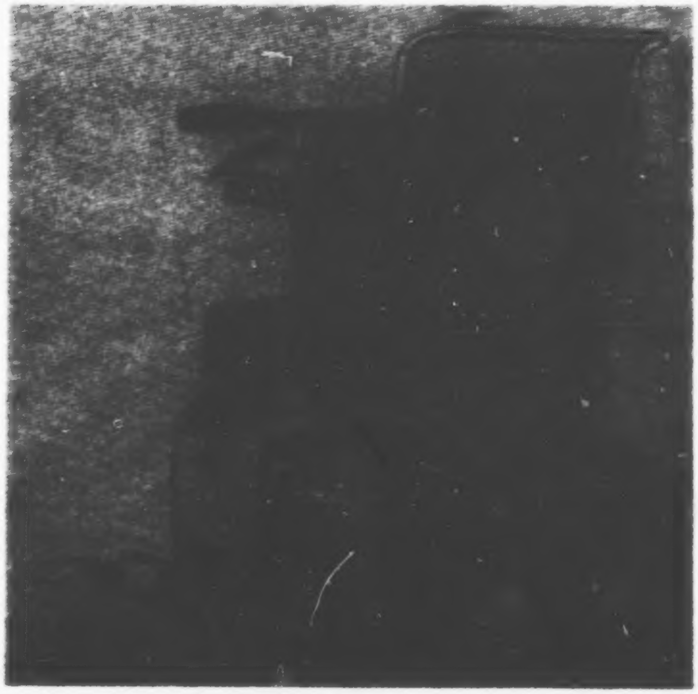
REPRESENTATIVE:

TRADE NAME: The Traveller

MODEL: C1

PATENT NO.: Pending

SUGGESTED RETAIL
PRICE (1981):



DESCRIPTION:

This is an all-purpose, three-wheeled outdoor/indoor electric vehicle, with pneumatic tires, capable of travelling on gravel and of negotiating a 6.3 cm (2 1/2") curb. It turns in a 217.5 cm (62") full circle. The vehicle, constructed of tubular steel, has an adjustable upholstered seat with folding upholstered arm rests. Foldable, metal foot rests are located forward of the front wheel. There are four forward and reverse speeds.

A 12-volt heavy traction type motor and a rechargable car type battery are located under the vehicle seat. An automatic battery charger is provided.

The removable T-bar steering column, with speed control lever, is located directly over the front wheel. A manual brake lever is located to the left of the vehicle.

OPERATION:

The user transfers into the vehicle after folding up an arm rest and removing the T-bar, if necessary. The ignition speed is controlled by pressure on the control lever. Releasing the lever causes the vehicle to slow down. The manual brake lever is used for braking.

SPECIFICATIONS:

Length: 102 cm (40")
Width: 70 cm (24")
Weight: 60 kg (132 lb)
Maximum speed: 6.4 km/h (4 mph)
Maximum gradient climbed: 1:6
Range: 22.4 km (14 miles)

WARRANTY:

REMARKS:

- user operated
- other available models:

  - E12 - shopping and travelling chair
  - E12F - steered by hand, controlled by feet
  - RR 100 S - side control, three wheels
  - E12 AP - attendant controlled

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Tricycle

OPERATION: Manual

MANUFACTURER: Tri-Aid Manufacturing Co. Ltd.
63 James Watt Place
College Milton North
East Kilbride Lanarkshire
Scotland G74 5HG
Tel: East Kilbride (03552) 33133

REPRESENTATIVE: Ian Macdonald, Managing Director

TRADE NAME: TRI-AID

MODEL: Large 16KD

PATENT NO.: 1,366,558 (U.K.); pending (U.S. and Canada)

DESCRIPTION:

This is a manually-operated, fold-away tricycle suitable for outdoor use by adults. The vehicle is constructed of tubular metal and features a tubular back rest, an upholstered seat and arm rests and a one-piece metal foot rest.

The handlebars rotate like the pedals of a conventional bicycle to steer and power the trike. Front coaster brakes enable the operator to control the speed without removing hands from the pedals. A parking brake is standard. There are three spoked wheels with fenders and balloon tires, 40.6 cm x 5.4 cm (16" x 2.125").

The vehicle may be fully dismantled for transportation or storage. The front piece, with handlebars, unbolts and the two knobs behind the seat unscrew to release the back rest frame. The arm rests also lift off.

OPERATION:

The user powers and steers the tricycle by operating the hand pedals on the handlebar. Back pedalling controls the speed.

SPECIFICATIONS:

Back rest height: 82.5 cm (32 1/2")
Seat height: 49.5 cm (19 1/2")
Seat depth: 29 cm (11 1/2")
Seat width: 42.5 cm (16 3/4")
Wheel base: 68.5 cm - 85 cm (27" - 33 1/2")
Speed: according to user capacity

WARRANTY:

REMARKS:

- user operated
- mini model and standard 12KD available for children
- accessories available

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Attachment to chair

OPERATION: Manual

MANUFACTURER:
Unicycle Inc.
2143 rue St. Patrick St.
Montreal, Que.
Canada H3K 1B3
Tel: (514) 933-8993

REPRESENTATIVE: Bernard Boivin, President and Director

TRADE NAME:

MODEL: i) three-speed ii) five-speed

PATENT NO.: Pending

SUGGESTED RETAIL PRICE (1981): i) $337.20 (Cdn.) ii) $387.20 (Cdn.)

DESCRIPTION:

This one-wheeled, cycle-type attachment converts a standard wheelchair into a tricycle capable of traversing gravel roads, lawns and hilly terrain. The three-speed model features hub-type gear change and coaster braking. The five-speed is similarly geared, but with one lower and one higher gear. The latter model utilizes a Shimano derailer system in conjunction with internal expanding hub brakes.

The wheelchair attachment consists of a crossbar structure and an angled front post. A hand crank with sprocket is mounted at the top of the post. The top sprocket is connected to the sprocket on the wheel by a bicycle-type chain. A speed change lever is located on the front post of both models. The five-speed model also features a brake lever.

OPERATION:

The user approaches the unicycle from behind, takes the unit by the top and pulls it toward and between his legs. The frame is adjusted to the wheelchair and secured by pushing on the extension lever, raising the caster wheels of the chair off the ground and inserting a stay pin. This unicycle is operated by hand pedalling. A selection of gears makes it possible to travel between 16 and 24 km/h (10 and 15 mph) on the level.

SPECIFICATIONS:

Length:
Width:
Height:
Weight: 9.5 kg (21 lb)
Wheel base:
Maximum forward speed: 24 km/h (15 mph)
Maximum gradient climbed: according to user capacity

WARRANTY:

. one year on frame
. three months on bicycle parts

REMARKS:

. user operated
. easily attached/detached
. stows in most car trunks
. unit can be modified to fit customized wheelchairs
. wheelchair seat width should be specified

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Attachment to chair
OPERATION:	Powered
MANUFACTURER:	Vessa Limited Paper Mill Lane Alton, Hants England GU34 2PY Tel: Alton (0420) 83294
REPRESENTATIVE:	J.E. Oliver, Sales Manager
TRADE NAME:	VESSA VITESSE
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	£328 approx.

DESCRIPTION:

This is a powered, indoor/outdoor, rear-wheel drive folding wheelchair capable of negotiating a 12.7 cm (5") curb. The curb-climbing attachments are mounted on the forward posts of the chair frame, just above the bottom rail. The attachments consist of two curved, rubber-treaded, chrome-plated tipping levers. When not in use, the levers are stored in an upright position. The levers are manually positioned for curb climbing. The chair features a chrome-plated frame, duofold back, quilted upholstery, locking detachable arm rests, swing-aside detachable foot rests and balloon tires on the caster wheels.

Two 12-volt batteries provide operating power. The batteries can be removed in their tray from the canvas case when the chair is folded.

A left- or right-hand fitted joystick operates the proportional controls. Brakes are manual.

OPERATION:

As the chair approaches a curb, the user places the tipping levers against the curb. The levers engage, raising the caster wheels. The levers swing up and the larger rear wheels climb the curb.

SPECIFICATIONS:

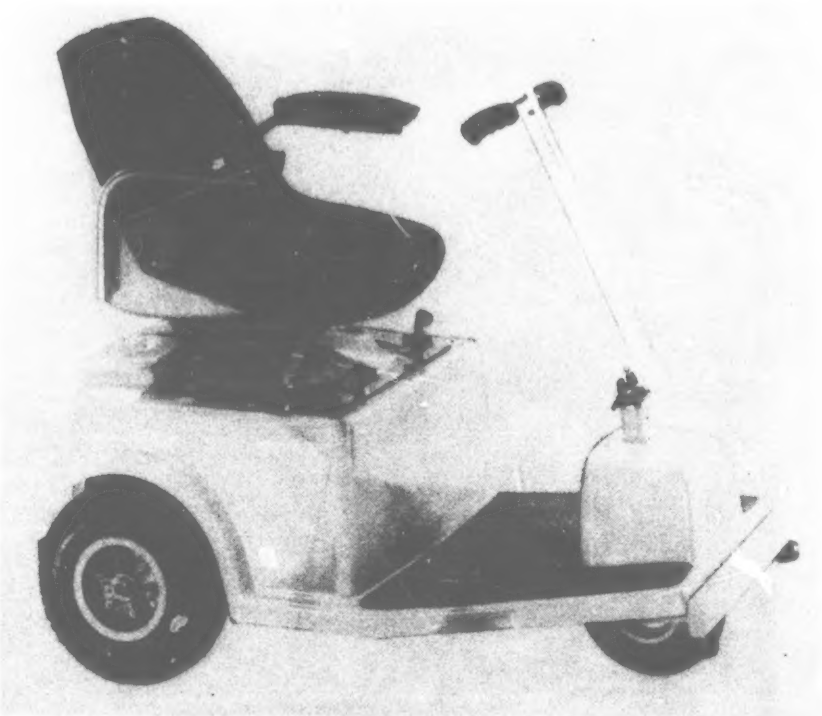
Length: 99 cm (39") with foot rests
Width: 63.5 cm (25")
Height: 94 cm (37")
Weight: 65.3 kg (144 lb)
Folded width: 33 cm (13")
Wheel base: 50.8 cm (20")
Maximum speed: 3.7 km/h (2 mph)
Maximum gradient climbed: 1:4
Range: 25.6 km (16 miles)

WARRANTY:

REMARKS:

- various seat widths available
- five-angle reclining back model available
- motor can be disengaged so an attendant can push the chair
- anti-tip stabilizers provided

EQUIPMENT:	NON-CONVENTIONAL WHEELCHAIR
TYPE:	Multi-purpose
OPERATION:	Powered
MANUFACTURER:	Voyager Inc. P.O. Box 1577 South Bend, IN U.S.A. 46634 Tel: (219) 288-0511
REPRESENTATIVE:	
TRADE NAME:	Voyager
MODEL:	i) Voyager IV ii) Voyager II
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	i) $1,895 (U.S.) ii) $1,995 (U.S.)



DESCRIPTION:

i) This is a three-wheeled, rear-wheel drive electric vehicle suitable for all-terrain outdoor use and with indoor manoeuvrability. Because of its close-coupled wheel base, it fits on van lifts and into small elevators. The vehicle has a steel tube frame with front and rear bumpers, two rear traction tread tires, 30.5 cm x 10 cm (12" x 4"), and one front wide rib tread tire, 22.8 cm x 7.6 cm (9" x 3"). The body is one-piece fibreglass. The removable seat assembly consists of a vinyl upholstered swivel seat and lift-off or swing-away padded arm rests. The adjustable steering tilting tiller is mounted on a fibreglass cowling over the vehicle's front wheel, leaving an unobstructed footwell between the body and the tiller.

Two 12-volt 24 C automobile batteries power two 24-volt, one horsepower track motors, located under the vehicle seat. An external polarized socket accepts any 12-volt battery charger.

Operating controls are mounted on the vehicle body, on each side of the seat assembly.

ii) The Voyager II has essentially the same features as the Voyager IV with the following exceptions:

- all three wheels have 30.5 cm x 10 cm (12" x 4") tires
- the cowling is larger and features a storage bin
- no front bumper
- the directional tilting tiller has a looped handle
- longer body and wheel base
- heavier vehicle

OPERATION:

Both vehicles have the same operating characteristics. The user raises an arm rest to facilitate transfer into the vehicle. The single "T"-handled operating lever to the right of the seat controls acceleration and braking. The user controls four speeds and the brake by "pulling to go and pushing to stop", similar to automobile hand controls. The forward/reverse lever is alongside the "T" lever. The range switch lever, which controls the normal and super speed levels, is located to the left of the driver's seat.

SPECIFICATIONS:

i)
Length: 104 cm (41")
Width: 63.5 cm (25")
Height: 87.6 cm (34 1/2")
Weight: 55.8 kg (123 lb) less battery
Shipping weight: 69.5 kg (153 lb)
Seat height from ground: 52 cm (20 1/2")
Wheel base: 71 cm (28")
Maximum speed: 12.8 km/h (8 mph)
Maximum gradient climbed: 30%
Range: 32 km (20 miles)

ii)
Length: 144.8 cm (57")
Width: 66 cm (26")
Height: 85 cm (33 1/2")
Weight: 59 kg (130 lb) less battery
Shipping weight: 72.6 kg (160 lb)
Wheel base: 99 cm (39")

WARRANTY:

- one year on parts and labour

REMARKS:

- a foot pedal control of speed and brake is available

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Multi-purpose

OPERATION: Powered

MANUFACTURER: Voyager Inc.
P.O. Box 1577
South Bend, IN
U.S.A. 46634
Tel: (219) 288-0511

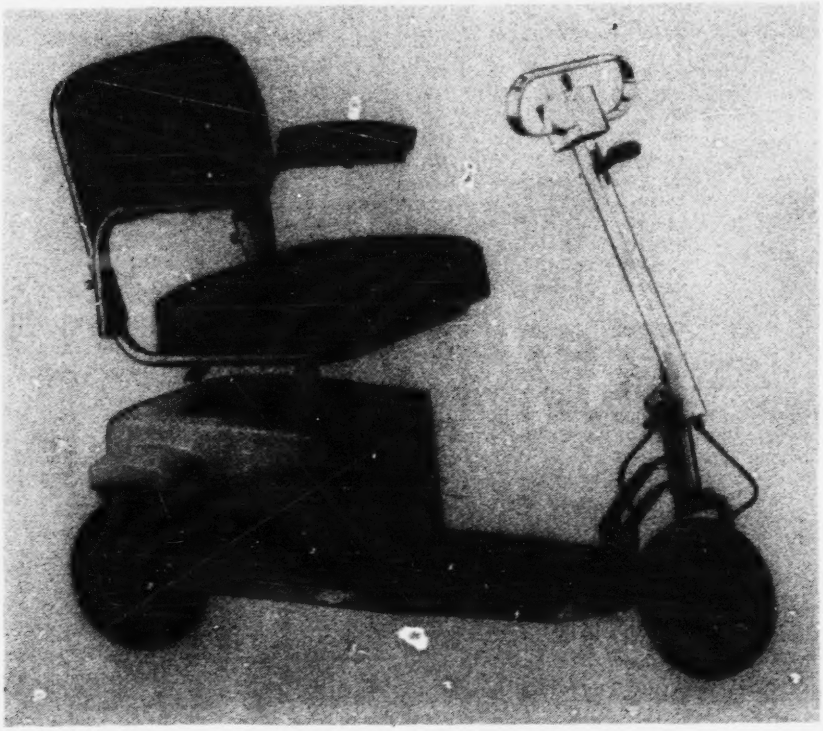
REPRESENTATIVE:

TRADE NAME: Voyager

MODEL: Voyager V

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): $1,795 (U.S.)



DESCRIPTION:

This is a three-wheeled, rear-drive, electric vehicle suitable for outdoor/indoor use. It is constructed of a steel tubing frame, with one-piece, lift-off, fibreglass body, which supports a swivelling, vinyl-upholstered, removable seat. The seat adjusts vertically, has an adjustable back, and lift-off or swing-away arm rests. The vehicle has an unobstructed footwell, dual cantilever front-wheel suspension and three aluminium wheels with 22.8 cm x 7.6 cm (9" x 3") rib tread pneumatic tires. Two 24-volt, 1/4 horsepower permanent magnet motors, located under the removable body, are powered by two 12-volt wet or gel-cell batteries. The gel-cell batteries, weighing 9.5 kg (21 lb) each, are approved for air travel.

The loop-handled, tilting, steering tiller supports the operating controls. A lock at the base of the tiller, above the front wheel, adjusts the tiller angle. There are two independent braking systems: an automatic speed-limiting on/off switch, useful for descending long grades, and a lever-operated front wheel drum brake, which can be locked for transfer or parking.

OPERATION:

The operator transfers into the vehicle after adjusting an arm rest and the steering tiller. The left- or right-mounted tiller controls are operated with one hand. The joystick provides proportional control for the two speed ranges, both forward or reverse. The switch-controlled automatic brake or the manual brake lever is operated from the tiller.

SPECIFICATIONS:

Length: 104 cm (41")
Width: 55.9 cm (22")
Height: 81.3 cm (32")
Weight: 35.8 kg (79 lb) less batteries
Shipping weight: 42.6 kg (94 lb)
Seat height from ground: 43 cm (17")
Wheel base: 81.3 cm (32")
Maximum speed: 9.6 km/h (6 mph)
Maximum gradient climbed: 20%
Range: 19.2 km (12 miles)

WARRANTY:

- one year on parts and labour

REMARKS:

- user operated
- may be adjusted to accommodate young children
- lift-off and folding features reduce size for easy stowage
- seat-belt anchorage provided

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Attachment

OPERATION: Manual

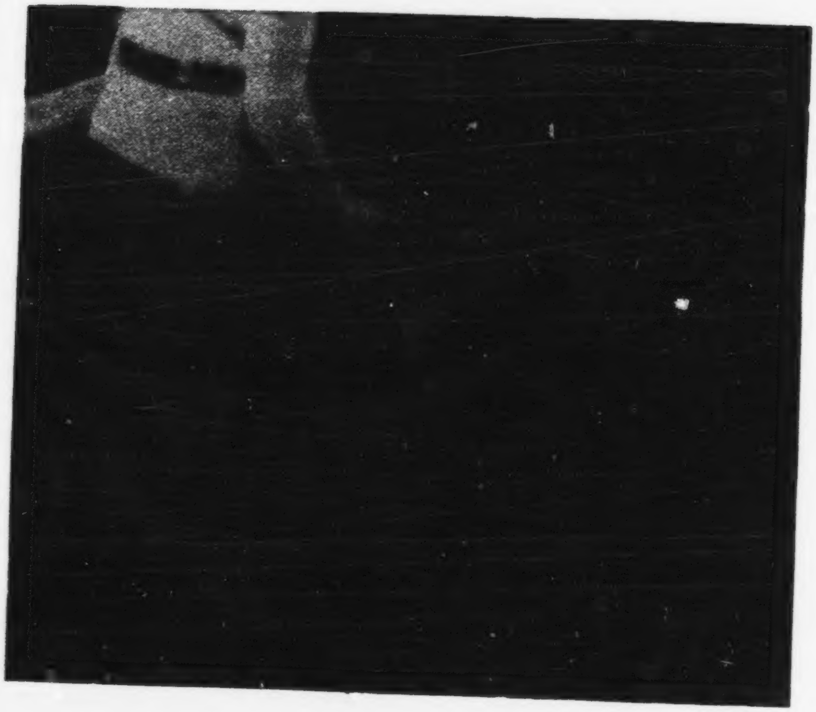
DEVELOPER: Les White
50 Abraham Bay
Winnipeg, Man.
Canada R2P 1G1
Tel: (204) 633-6205

TRADE NAME:

MODEL:

PATENT NO.: Pending

SUGGESTED RETAIL PRICE (1981): $485 (Cdn.) approx.



DESCRIPTION:

This wheelchair attachment converts a conventional manual wheelchair into one capable of negotiating an escalator. The large rear wheels of the chair are removed and 20.3 cm (8") semi-pneumatic rubber caster wheels are substituted. The adaptive hardware consists of: a horizontal anti-fold bar extending between the rear wheels; a stabilizing foot pedal; and metal housings outside the rear wheels. The housings contain the stabilizing pads and brake mechanisms. An aircraft-type safety belt is provided to prevent the occupant from slipping or lurching from the chair.

OPERATION:

To ascend, the attendant, guiding the wheelchair, backs up to the moving escalator. From the escalator stair above the chair, the attendant steps on the stabilizing pedal as the stair reaches pedal level. This locks both rear wheels. The stabilizing pads and the rear wheels are both on the same stair, creating a stabilizing effect on the stair above. The front wheels of the chair are free of the escalator. To descend, the attendant wheels the chair forward onto the escalator and steps on the stabilizing pedal as the escalator stair meets it. During operation the horizontal metal bar rests on the front end of the escalator stair.

SPECIFICATIONS:

WARRANTY:

REMARKS:

- attendant operated
- used by Air Canada in Edmonton and Saskatoon Airports and by Pacific Western Airlines in Saskatoon Airport

EQUIPMENT: NON-CONVENTIONAL WHEELCHAIR

TYPE: Entry/exit unit

OPERATION: Powered

MANUFACTURER: Wilgot Åhs Innovation AB
S-670 41 Koppom
Sweden

TRADE NAME:

MODEL: Prototype

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):

DESCRIPTION:

The system consists of a specially constructed electric wheelchair and an automatic lifting device, which can transfer the chair to the front seat of a regular car. A mechanized device opens and shuts the car door. An electric combination lock is also provided. A severely disabled person, remaining in a wheelchair, is able to open the car door, enter the vehicle and operate the vehicle or travel as a passenger.

OPERATION:

SPECIFICATIONS:

WARRANTY:

REMARKS:

- user operated
- driver or passenger application
- prototype in evaluation process

IV WHEELCHAIR LOADERS

For wheelchair users driving their own cars, loading and storing the wheelchair may be the only barrier to independent mobility. Wheelchair loading devices have been developed to overcome this obstacle. Loaders may be categorized according to storage site in the vehicle:

- back seat
- trunk
- roof
- rear bumper.

Manual, semi-automatic and automatic models are represented in these categories.

Significant factors influencing choice are:

- strength and dexterity of user
- type of vehicle driven
- type of wheelchair used
- climatic conditions.

WHEELCHAIR LOADERS

MANUFACTURER	TYPE				OPERATION			CONTROL		APPLICATION			REMARKS
	ROOF	REAR SEAT	TRUNK	REAR BUMPER	MANUAL	SEMI-AUTOMATIC	AUTOMATIC	USER	ATTENDANT	2 DOOR CAR	4 DOOR CAR	STATION WAGON /TRUCK	
1. AMIGO SALES, INC. AMIGO AUTO		X				X		X			X		G.M. "X" compact, front wheel drive
AMIGO TRUNK LIFT			X			X			X	X	X		Also suitable for hatchbacks/station wagons
2. ANTHONY'S AUTO WHEELCHAIR LIFT CO.		X				X		X		X			Full and intermediate size American cars
3. ARCOA INDUSTRIES E-Z TILT LOADER			X		X				X	X	X		Any trunk large enough to hold wheelchair
4. CHAIR CADDY INC.	X						X	X		X	X	X	
5. CHRYSLER CANADA LTD.		X				X		X		X			Full size and compact cars
6. D.G. HODGE & SON LTD.		X				X		X	X	X			System can be fitted for trunk loading or for station wagons
7. JEAN LODES & ASSOC. SAV-A-LIFT			X			X		X	X	X	X	X	Designed to load the Amigo. Also suitable for vans and trucks
8. NELSON MEDICAL PRODUCTS				X	X				X	X	X	X	Bumper height must be less than 25.4 cm (10")

WHEELCHAIR LOADERS

MANUFACTURER	TYPE				OPERATION			CONTROL		APPLICATION			REMARKS
	ROOF	REAR SEAT	TRUNK	REAR BUMPER	MANUAL	SEMI-AUTOMATIC	AUTOMATIC	USER	ATTENDANT	2 DOOR CAR	4 DOOR CAR	STATION WAGON /TRUCK	
9. WHEEL-CHAIR CARRIER CO. TILT-n-TOTE				X	X				X	X	X	X	Also accommodates scooters
10. THE WHEELCHAIR CARRIER CORP. EZ-1			X		X				X	X	X	X	Any trunk large enough to hold wheelchair
11. THE WHEELCHAIR CARRIER SALES CORP. MARK VII LOADER	X						X	X		X	X	X	

EQUIPMENT: WHEELCHAIR LOADER

TYPE: Rear seat loader

OPERATION: Semi-automatic

MANUFACTURER: Amigo Sales, Inc.
6693 Dixie Highway
Bridgeport, MI
U.S.A. 48722
Tel: (517) 777-0910

REPRESENTATIVE: Debbie Mills, International Sales

TRADE NAME: Amigo-Auto

MODEL: For GM "X" model car

PATENT NO.:

SUGGESTED RETAIL PRICE (1981): $2,500 (U.S.) plus cost of vehicle

DESCRIPTION:

The Amigo semi-automatic electro-mechanical loader is especially designed for installation in the GM "X" model, four-door compact, front-wheel drive car. The system consists of a boom and cable assembly, which operates on the crane principle and is installed on the roof inside the vehicle, just behind the car door pillar.

An electric motor driven by the vehicle's battery provides lifting and lowering power.

The control switch is located inside the car door pillar.

OPERATION:

The user transfers into the driver's seat, removes the drive handle of the Amigo to store it within the car, and slides the boom and cable out over the Amigo. When the cable is clipped onto the Amigo platform, the user activates the electric motor switch inside the car door pillar and the Amigo is lifted to proper height. The electric motor slides the suspended Amigo into the back seat. The control switch is reversed to lower the Amigo to the car floor.

SPECIFICATIONS:

INSTALLATION:

WARRANTY:

REMARKS:
- user operated
- Amigo Trunk Lift available

EQUIPMENT:	WHEELCHAIR LOADER
TYPE:	Rear seat loader
OPERATION:	Semi-automatic
MANUFACTURER:	Anthony's Auto Wheelchair Lift Co. 3293 South Seymour Road Swartz Creek, MI U.S.A. 48473 Tel: (313) 635-9698
REPRESENTATIVE:	Agnes K. Pobocik, President
TRADE NAME:	Anthony's Auto Wheelchair Lift
MODEL:	
PATENT NO.:	Pending
SUGGESTED RETAIL PRICE (1981):	$1,150 (U.S.) factory direct

DESCRIPTION:

This electrically controlled wheelchair loader is suitable for interior installation in two-door full size and intermediate American cars. It is designed to be used by the independent driver to load and unload a wheelchair. The unit, which is steel and aluminium, consists of a parallel linkage lifting arm mounted on a floor-mounted track behind the front seat. The arm extends out to accommodate a wheelchair with a seat depth of 40.6-46 cm (16"-18").

The vehicle's 12-volt electrical system runs the electrically driven mechanism, which lifts and lowers the arm and moves the assembly in and out.

Electrical controls are located in the front seat on an extendable cable. The controls are normal power window switches to control the up/down, in/out motions of the unit.

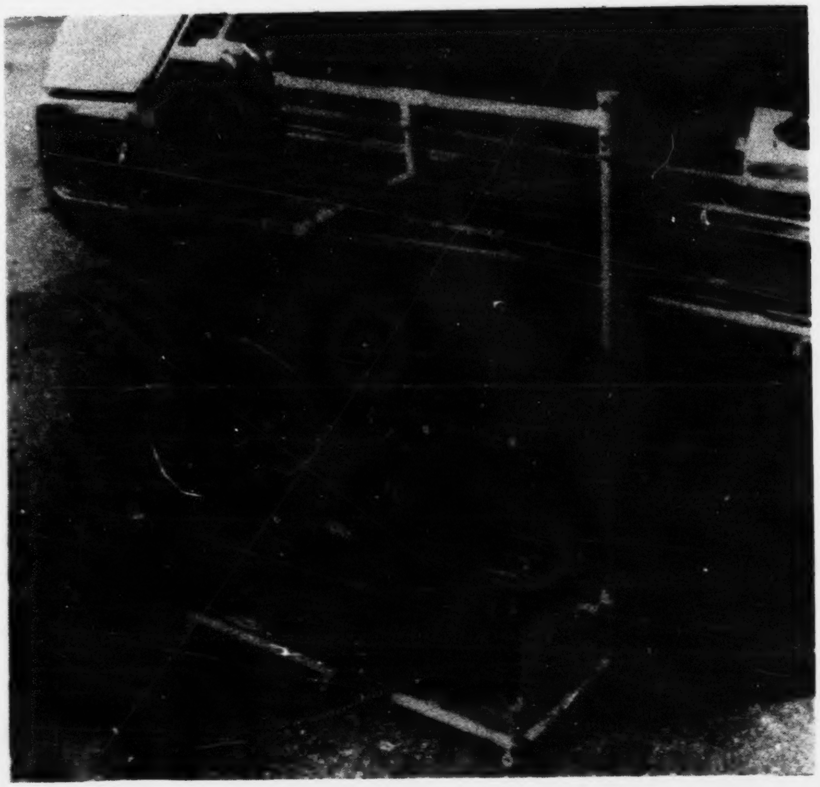
OPERATION:

The wheelchair user transfers to the driver's seat, removes the chair's foot rests and stores them within the car. The chair is folded and positioned to face the car opening to receive the lift extension bar. The out and down switches are operated extending and lowering the unit so that the extension bar is under the folded chair seat. Activating the up switch causes the unit to lift the chair to car opening height. The car seat may now have to be moved forward so that the chair will be moved into the car upon activation of the in switch. The car seat may now be re-positioned and the loading unit lowered to stored position.

SPECIFICATIONS:

INSTALLATION:	. secured to vehicle floor with five sheet metal screws
WARRANTY:	. ninety days on parts and labour
REMARKS:	. user operated . pre-1977 car models may require modifications . adjusts to accommodate chairs 94 cm (37") high with seat 46 cm x 46 cm (18" x 18") . folded dimension is 30 cm (11 3/4")

EQUIPMENT:	WHEELCHAIR LOADER
TYPE:	Trunk loader
OPERATION:	Manual
MANUFACTURER:	ARCOA Industries 10761 - H Woodside Ave. Santee, CA U.S.A. 92071 Tel: (714) 449-6365
REPRESENTATIVE:	James S. Picard, Marketing Director
TRADE NAME:	E-Z Tilt Loader
MODEL:	# 700
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	$85 (U.S.)



DESCRIPTION:

This manual unit will load the traditional folding wheelchair into the trunk of most automobiles. The unit consists of a free-standing P.V.C. frame featuring a combination of perpendicular and horizontal bars, a hinged crossbar, hooks, and an E-Z security strap.

OPERATION:

The attendant folds the wheelchair and rolls it into the tilt loader frame. The hinged crossbar is lowered and a security strap is hooked between the lower horizontal bar of the unit and the crossbar to hold the chair in position. The attendant then grasps the lower horizontal bar and eases the unit, with the wheelchair attached, into the trunk.

SPECIFICATIONS:

INSTALLATION:

WARRANTY:

REMARKS:
- attendant operated
- V.A. approved

EQUIPMENT: WHEELCHAIR LOADER

TYPE: Roof loader

OPERATION: Automatic

MANUFACTURER: Chair Caddy Inc.
24 W. 7th Street
Tempe, AZ
U.S.A. 85281
Tel: (602) 968-1840

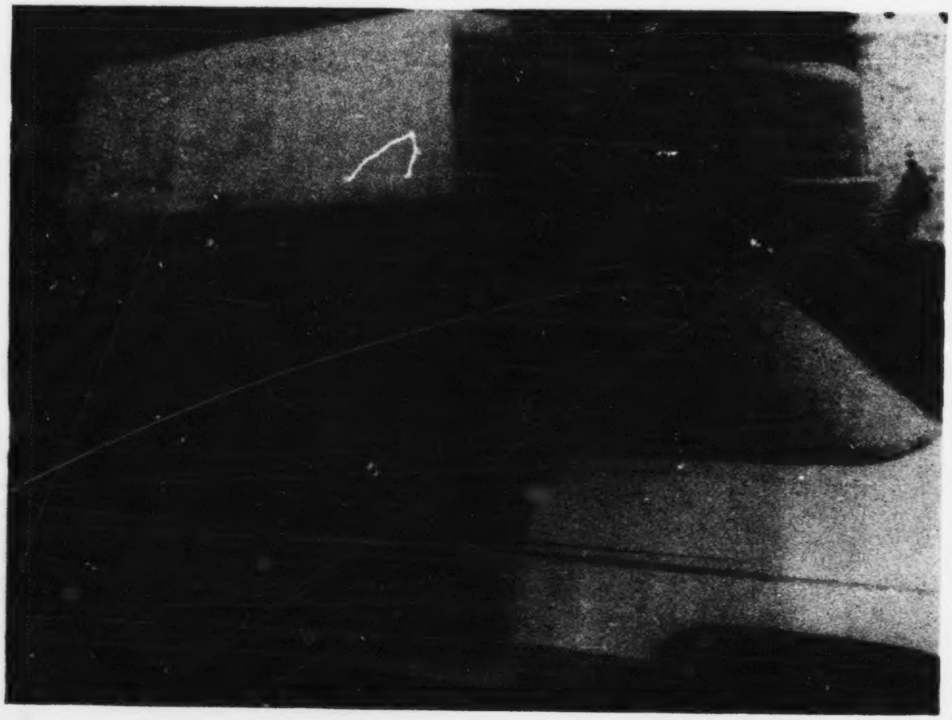
REPRESENTATIVE:

TRADE NAME: Chair Caddy

MODEL: Series No. 100

PATENT NO.:

SUGGESTED RETAIL
PRICE (1981):



DESCRIPTION:

This wheelchair loader is an electro-mechanical type for installation on the roof of a vehicle. The unit consists of a winch mechanism and lifting cable housed in a fibreglass-covered shell.

Two 12-volt DC motors that use the vehicle battery as power source operate the unit.

Two simple, conveniently located switches control the unit.

OPERATION:

The user transfers to the driver's seat, folds the wheelchair and activates a switch to operate the unit. The covering shell begins to open horizontally and the lifting mechanism drops down to chair level. Once the chair is attached to the cables, the user activates a second switch to raise and store the chair, and close the covering shell.

SPECIFICATIONS: Dimensions: 129.5 cm x 129.5 cm x 43 cm
(51" x 51" x 17")

INSTALLATION:

WARRANTY:

REMARKS: . user operated

EQUIPMENT: WHEELCHAIR LOADER

TYPE: Rear seat loader

OPERATION: Semi-automatic

MANUFACTURER: Chrysler Canada Ltd.
Chrysler Center
Windsor, Ontario
Canada N9A 4H6
Tel: (519) 252-3651

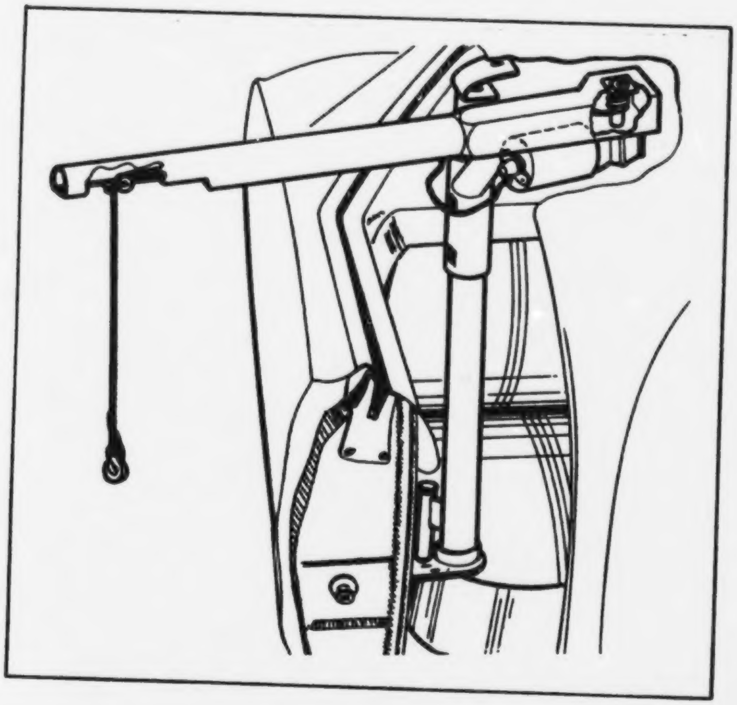
REPRESENTATIVE: S.M. "Stan" McDowall, P. Eng.

TRADE NAME:

MODEL:

PATENT NO.: No plans to patent

SUGGESTED RETAIL PRICE (1981):



DESCRIPTION:

Chrysler designed this motor-driven wheelchair loader for installation on the right inside quarter panel, behind the passenger seat, of most two-door models of compact or larger cars. The system consists of a perpendicular metal post bracketed to the quarter panel, and a boom, housing a hooked lifting cable, which is attached to the top of the post. The boom swings in and out manually. Power front seats are recommended to allow sufficient room for the folded chair to enter the rear seat area.

The vehicle's electrical system provides power for the unit. A lever-type control switch is mounted according to driver preference.

OPERATION:

The user transfers from the wheelchair into the right front passenger seat of the vehicle, positioning and folding the chair parallel with the car. The user swings the boom outward and secures the chair by hooking it to the hoist cable. The user then transfers to the driver's seat, folds the passenger seat forward, and activates a lever-type switch to raise the chair. The chair pivots into the car and is lowered by reverse activation of the switch. The user may use an extension hook to guide the wheelchair into the car. The passenger seat returns to its vertical, locked position and then is electrically driven rearward. To unload, the procedure is reversed. An extension hook allows the user to open and close the door from the driver's seat.

SPECIFICATIONS:

INSTALLATION:

WARRANTY:

REMARKS:

- user operated
- can be modified to fit most two-door car models
- Chrysler Canada Ltd. offers the concept and design to interested persons.

EQUIPMENT: WHEELCHAIR LOADER

TYPE: Rear seat loader

OPERATION: Semi-automatic

MANUFACTURER: D.G. Hodge & Son Ltd.
15 Hurstdene Ave.
Staines, Middlesex
England
Tel: Staines (81) 52981

REPRESENTATIVE: D.G. Hodge

TRADE NAME:

MODEL:

PATENT NO.:

SUGGESTED RETAIL PRICE (1981):

DESCRIPTION:

This wheelchair loader is an electric winch suitable for lifting a traditional, manual, folding wheelchair into almost any model of car that has a wide enough door. According to car model, the winch can be fitted on the door pillar, which would enable the driver to put the wheelchair behind the front seats, or, alternatively, the winch can be fitted to lift the wheelchair into the trunk or into a station wagon.

OPERATION:

SPECIFICATIONS:

INSTALLATION:

WARRANTY:

REMARKS:

- user or attendant operated
- special electric lifting gear to lift an electric wheelchair with batteries into a station wagon is available

EQUIPMENT:	WHEELCHAIR LOADER
TYPE:	Trunk loader
OPERATION:	Semi-automatic
MANUFACTURER:	Jean Lodes & Assoc. 1901 Ulmerton Road Largo, FL U.S.A. 33540 Tel: (813) 586-2122
REPRESENTATIVE:	Jean A. Lodes, National Distributor
TRADE NAME:	Sav-A-Lift
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	$625 (U.S.) plus shipping

DESCRIPTION:

This wheelchair loader is an electro-mechanical unit especially designed for the Amigo, and suitable for installation on the rear bumper of most cars, station wagons, vans and trucks. The epoxy-finished, steel tubing bearing hitch bolts to the vehicle's rear bumper. The steel hoist, which attaches to the hitch, swings the Amigo in or out. The hoist may be easily removed for storage.

The vehicle's power supply or the wheelchair power pack drives an electric motor that operates the unit.

OPERATION:

The user or attendant takes the hoist from the vehicle trunk and attaches it to the permanent bumper bracket. The seat and handle of the Amigo are then removed and stored in the vehicle trunk. The user attaches the hoist to the Amigo and operates the up/down switch to lift the Amigo, batteries intact, into the trunk. When the Amigo is loaded, the hoist is simply lifted straight up to remove it from the hitch, and is replaced in the trunk.

SPECIFICATIONS:

Dimensions: less than 91.4 cm (36") folded length
Capacity: 45.4 kg (100 lb)
Weight: 7.7 kg (17 lb)

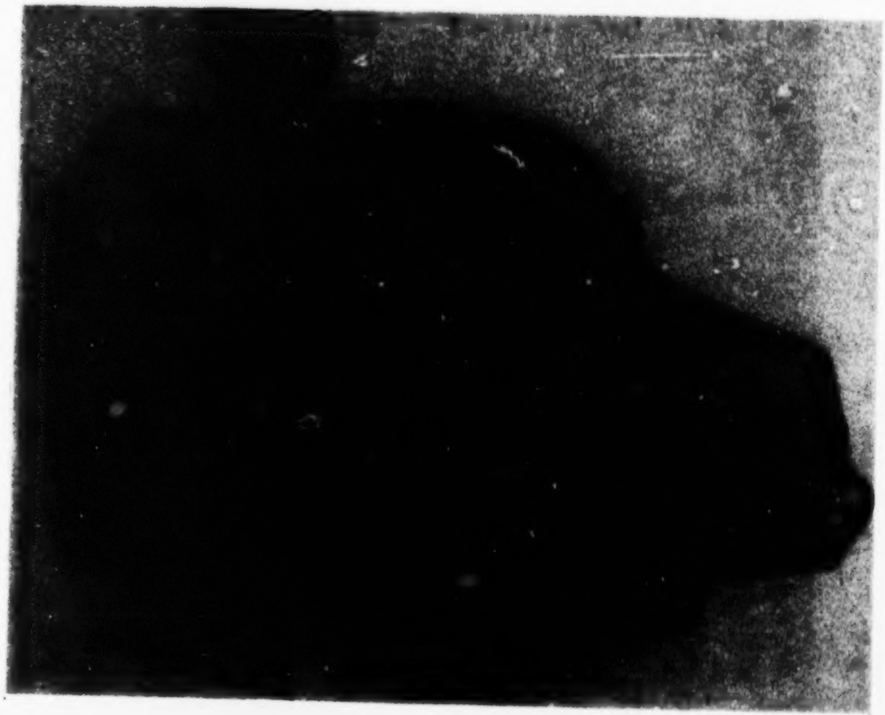
INSTALLATION:

WARRANTY:

REMARKS:

- user or attendant operated

EQUIPMENT:	WHEELCHAIR LOADER
TYPE:	Rear bumper loader
OPERATION:	Manual
MANUFACTURER:	Nelson Medical Products 5690 - F Sarah Ave. Sarasota, FL U.S.A. 33583 Tel: (813) 924-2058
REPRESENTATIVE:	
TRADE NAME:	
MODEL:	
PATENT NO.:	
SUGGESTED RETAIL PRICE (1981):	



DESCRIPTION:

This wheelchair carrier is a manual system suitable for installation on rear bumpers less than 25.4 cm (10") high. The system consists of a heavy-gauge, but lightweight, rustproof, alumimium carrier frame pinned into aluminium sockets installed on the bumper. The frame features upper and lower "hangers" from which to suspend the chair, and a tie-down mechanism to secure it. When not in use, the frame may be unpinned and stored.

OPERATION:

The attendant first folds the wheelchair, tips it back and hooks the front of the chair to the lower hanger on the carrier frame. The back of the chair is then rotated up and suspended from the upper hanger and the tie-down fastened. A cover may be placed over the chair and carrier.

SPECIFICATIONS:

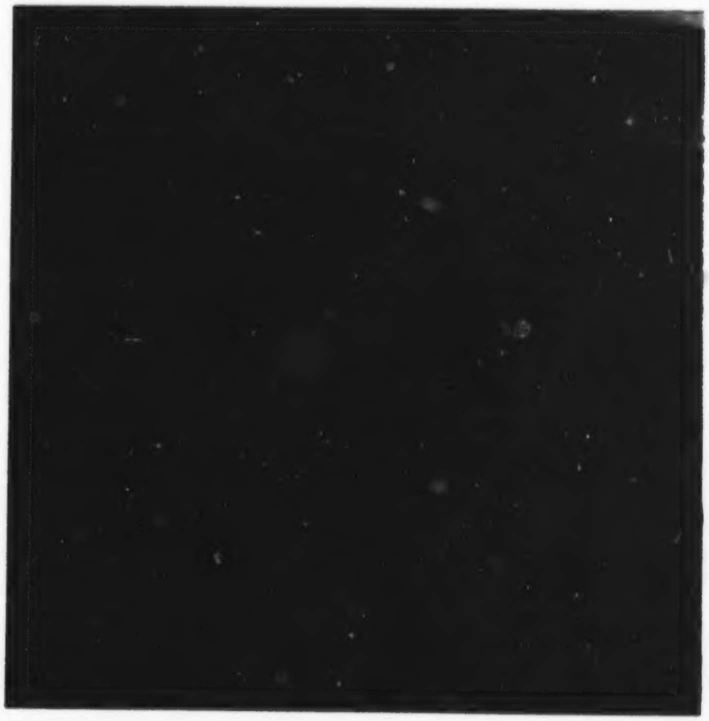
INSTALLATION:

WARRANTY:

REMARKS:

- attendant operated
- accommodates traditional chairs only
- will not fit bumpers higher than 25.4 cm (10")
- leaves back seat free

EQUIPMENT:	WHEELCHAIR LOADER
TYPE:	Outside rear bumper loader
OPERATION:	Manual
MANUFACTURER:	Wheel-Chair Carrier Co. P.O. Box 103 Waterville, OH U.S.A. 43566 Tel: (419) 878-0015
REPRESENTATIVE:	Ed M. Mugons, President
TRADE NAME:	TILT-n-TOTE
MODEL:	
PATENT NO.:	International patent
SUGGESTED RETAIL PRICE (1981):	$209.25 (U.S.) deluxe model with cover $229.25 (U.S.) power chair unit without cover Shipped to Canada sales tax- and duty-free



DESCRIPTION:

This manual wheelchair carrier will accommodate all sizes of wheelchairs with standard or pneumatic front and rear wheels. It is suitable for rear mounting on most vehicles. The unit consists of a chrome-plated steel rod and tube frame, as well as a metal sway bar assembly kit for attaching to a trailer hitch. The frame features two large loops to hold the rear wheels of the chair and two smaller loops to hold the front wheels. The unit tilts down for loading or unloading of the wheelchair and up to the bumper for storage.

OPERATION;

To load the folded wheelchair, the carrier frame is put into tilt-down position and the rear wheels rolled into the large "saddles". The front wheels will automatically fit into the small "saddles". A lock-down action holds the wheels in each saddle. A small push will send the carrier and chair into a counter-balance action as a spring lock automatically fastens to hold the chair in position for transportation.

The chair may be protected with a weather resistant cover.

SPECIFICATIONS:

INSTALLATION:	. attaches to standard class #1, #2, or #3 trailer hitch (less ball)
WARRANTY:	. one year on parts and labour . no guarantee on chrome . cover guaranteed free from material defects only
REMARKS:	. attendant operated . accommodates three-wheeled scooters . especially suitable for compact and sub-compact cars . padlocks for security . three new models fit Everest & Jennings 3N and 3P models

EQUIPMENT:	WHEELCHAIR LOADER
TYPE:	Trunk loader
OPERATION:	Manual
MANUFACTURER:	The Wheelchair Carrier Corp. 3509 East Cannon Drive P.O. Box 9328 Phoenix, AZ U.S.A. 85068 Tel: (602) 996-6123
REPRESENTATIVE:	
TRADE NAME:	
MODEL:	EZ-1
PATENT NO.:	4,073,395 (U.S.)
SUGGESTED RETAIL PRICE (1981):	$219 (U.S.) F.O.B.

DESCRIPTION:

This wheelchair loader operates on the leverage principle, thereby multiplying the strength of the user to effortlessly load a wheelchair into the trunk of a car.

The EZ-1 will fit any station wagon or car that can hold a folded wheelchair. One screw is required to install the unit.

OPERATION:

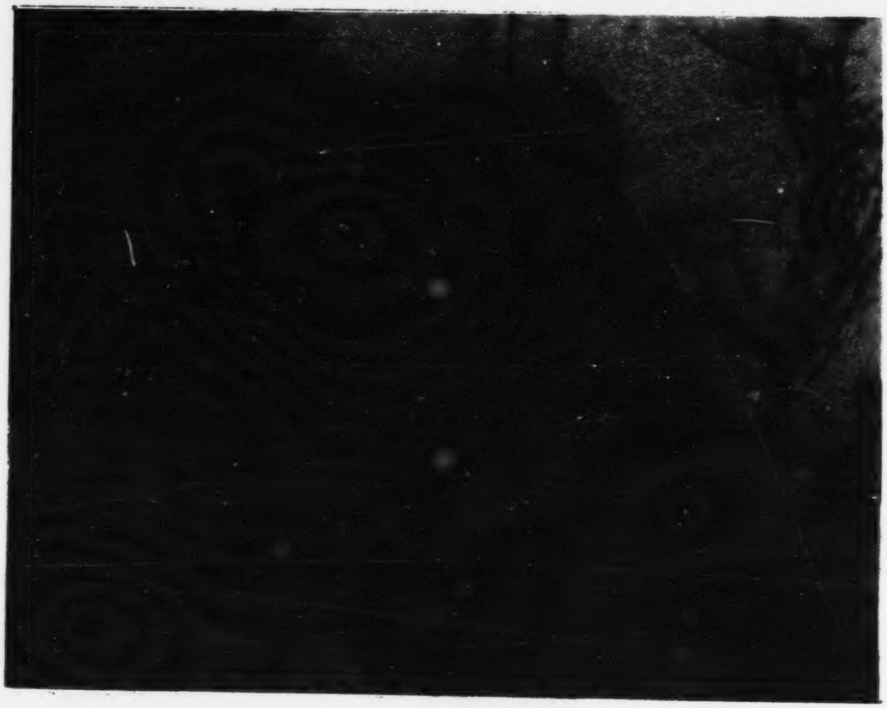
The leverage principle makes it possible to load a folded wheelchair over the rear bumper of the automobile and forward into the trunk. A piece of carpet protects the rear of the car from scratches. Velcro straps hold the chair in position during the loading operation.

SPECIFICATIONS:

INSTALLATION:

WARRANTY:	. two years on parts and labour
REMARKS:	. attendant operated

EQUIPMENT:	WHEELCHAIR LOADER
TYPE:	Roof loader
OPERATION:	Automatic
MANUFACTURER:	The Wheelchair Carrier Sales Corp. P.O. Box 16202 Phoenix, AZ U.S.A. 85011 Tel: (602) 272-1788
REPRESENTATIVE:	
TRADE NAME:	Mark VII Loader
MODEL:	CHF 100
PATENT NO.:	4,134,509 (U.S.)
SUGGESTED RETAIL PRICE (1981):	$1,795 (U.S.) F.O.B. plus $100 (U.S.) installation



DESCRIPTION:

This wheelchair loader is an electro-mechanical unit for installation on the roof of a car, van or pick-up truck. The unit consists of an electric winch mechanism constructed of steel, aluminium and nylon, with sealed ball bearings and an aircraft-type lifting cable. This mechanism is housed in a shell constructed of reinforced, polished fibreglass or aluminium with white baked-on enamel.

A "power-window" type 12-volt electric motor, specifically designed not to overheat in the stalled position, operates the unit. The vehicle's electrical system supplies power.

Controls are conveniently located for operation of the unit from the driver's seat.

OPERATION:

From the driver's seat the user activates the electric mechanism to open the cover of the unit. As the cover opens the folded wheelchair starts to emerge and "set-up" for lowering. The wheelchair then descends alongside the car until it reaches the ground where the user unsnaps it from the cable. The loader cable then ascends to the carrier unit, and the user unfolds the wheelchair ready for transfer from the car seat.

SPECIFICATIONS:	Dimensions: 122 cm x 152.4 cm x 53.3 cm (48" x 60" x 21")
INSTALLATION:	
WARRANTY:	. ninety days on material and labour . one year on parts only
REMARKS:	. user operated . V.A. approved

APPENDIX A

LIST OF MANUFACTURERS/DEVELOPERS

MANUFACTURERS/DEVELOPERS OF WHEELCHAIR LIFTS

1. ABC Enterprises Inc.
8905 Mentor Ave.
Mentor, OH
U.S.A. 44060
Tel: (216) 255-5211

2. American Golden Boy
Sales Corp.
2556 S. Fairview St.
Santa Ana, CA
U.S.A. 92704
Tel: (714) 957-8581

3. Apener Maschinenbau und
Förderanlagen (AMF)
Gustav Bruns GMBH & CO. KG
2913 Apen (OLDB)
Federal Republic of Germany
Tel: (0 49 82) 52 25/6

4. The Braun Corp.
1014 South Monticello St.
Winamac, IN
U.S.A. 46996
Tel: (219) 946-6157

5. C.N. Unwin Limited
Lufton
Yeovil, Somerset,
England BA22 8SZ
Tel: Yeovil (0935) 5359

6. Coach & Equipment
Manufacturing Corp.
P.O. Box 36
Penn Yan, N.Y.
U.S.A. 14527
Tel: (315) 536-2321

7. Collins Industries Inc.
P.O. Box 58
Hutchinson, KS
U.S.A. 67501
Tel: (316) 663-4441

8. Crow River Industries, Inc.
1415 East Wayzata
Wayzata, MN
U.S.A. 55391
Tel: (612) 475-2786

9. Drive-Master Corporation
16 Andrews Drive
West Paterson, N.J.
U.S.A. 07424
Tel: (201) 785-2204

10. Electro Van Lift Inc.
140 Concord,
near Robert St.
St. Paul, MN
U.S.A. 55107
Tel: (612) 298-0721

11. Environmental Equipment
Corp. (EEC)
310 Preda Street
San Leandro, CA
U.S.A. 94577
Tel: (415) 568-1442

12. Fred Scott & Sons
1444 W. Rand Road
Des Plaines, IL
U.S.A. 60016
Tel: (312) 297-1603

13. Handicaps Inc.
4335 South Santa Fe Drive
Denver, CO
U.S.A. 80110
Tel: (303) 781-2062

14. Lift-U-Inc.
402 Third & Lenora Building
2112 Third Avenue
Seattle, WA
U.S.A. 98121
Tel: (206) 624-5556

15. Mac's Lift Gate Corporation
2727 South Street
Long Beach, CA
U.S.A. 90805
Tel: (213) 634-5962

16. Mobility Dynamics Inc.
21029 Itasca Ave.
Chatsworth, CA
U.S.A. 91311
Tel: (213) 998-1026

17. P & Q Lifts Inc.
4457 - 63 CIR. No.
Pinellas Park, FL
U.S.A. 33565
Tel: (813) 522-9024

18. Para Industries (1978) Ltd.
74 Jamie St.
Nepean, Ontario
Canada K2E 6T6
Tel: (613) 226-5506

19. Ratcliff Tail Lifts Ltd.
Bessemer Road
Welwyn Garden City
Hertfordshire
England AL7 1ET
Tel: Welwyn Garden
(07073) 25571

20. Reb Manufacturing Inc.
P.O. Box 276, R.R. 2
Carey, OH
U.S.A. 43316
Tel: (419) 396-7651

21. Ricon Sales Inc.
11684 Tuxford St.
Sun Valley, CA
U.S.A. 91352
Tel: (213) 768-5890

22. Services Industriels
Savaria Enr.
199 Ave. St. Joseph
Oka, Quebec
Canada J0N 1E0
Tel: (514) 479-6414

23. Skillcraft Industries, Inc.
1270 Ogden Road
Venice, FL
U.S.A. 33595
Tel: (813) 488-1501

24. Target Industries Inc.
55 Newberry Road
Warehouse Point, CT
U.S.A. 06088
Tel: (203) 627-9329

25. Total Mobility Systems & Designs Inc.
4060 Stewart Road
Eugene, OR
U.S.A. 97402
Tel: (503) 686-9706

26. Transi-Lift Equipment Corp.
#105-1120-53rd Ave. N.E.
Calgary, Alberta
Canada T2E 6N9
Tel: (403) 275-8801

27. Transportation Design and Technology, Inc.
9530 Cabot Drive
San Diego, CA
U.S.A. 92126
Tel: (714) 578-9420

28. Vapor International
Vapor Corp.
6420 West Howard Street
Chicago, IL
U.S.A. 60648
Tel: (312) 631-9200

Vapor Canada Inc.
3955 de Courtrai Ave.
Montreal, Quebec
Canada H3S 1B9
Tel: (514) 342-3210

MANUFACTURERS/DEVELOPERS OF WHEELCHAIR SECUREMENTS

1. Advanced Mobility, Inc.
15912 Arminta Street
Van Nuys, CA
U.S.A. 91406
Tel: (213) 782-0200

2. Aeroquip Corporation
Industrial Division
1225 West Main St.
Van Wert, OH
U.S.A. 45891
Tel: (419) 238-1190

Aeroquip (Canada) Ltd.
287 Bridgeland Avenue
Toronto, Ontario
Canada M6A 1Z7
Tel: (416) 789-1831

3. American Seating Company
Transportation Seating Division
901 Broadway N.W.
Grand Rapids, MI
U.S.A. 49504
Tel: (616) 456-0673

4. Apener Maschinenbau und Förderanlagen (AMF)
Gustav Bruns GMBH & CO. KG
2913 Apen (OLDB)
Federal Republic of Germany
Tel: (0 49 82) 52 25/6

5. The Braun Corp.
1014 South Monticello St.
Winamac, IN
U.S.A. 46996
Tel: (219) 946-6157

6. Bud Industries, Inc.
100 West Pulaski Street
West Warwick, RI
U.S.A. 02893
Tel: (401) 822-2352

7. C.N. Unwin Limited
Adam's Peak Works
Lufton
Yeovil, Somerset
England BA22 8SZ
Tel: Yeovil (0935) 5359

8. Chas. Olsen & Sons
677 Transfer Road
St. Paul, MN
U.S.A. 55114
Tel: (612) 641-3900

9. Coach and Car Equipment Corp.
1951 Arthur Avenue
Elk Grove Village, IL
U.S.A. 60007
Tel: (312) 437-5760

10. Collins Industries Inc.
Special Products Division
P.O. Box 58
Hutchinson, KS
U.S.A. 67501
Tel: (316) 663-4441

11. Creative Controls Inc.
1354-I Combermere
Troy, MI
U.S.A. 48084
Tel: (313) 585-0985

12. Crow River Industries, Inc.
1415 East Wayzata Blvd.
Wayzata, MN
U.S.A. 55391
Tel: (612) 475-2786

13. Drive-Master Corporation
16 Andrews Drive
West Paterson, N.J.
U.S.A. 07424
Tel: (201) 785-2204

14. Dynamic Mobilities Inc.
P.O. Box 1493
2070 Helena Street
Madison, WI
U.S.A. 53704
Tel: (608) 251-2882

15. Electro Van Lift, Inc.
140 Concord, near Robert St.
St. Paul, MN
U.S.A. 55107
Tel: (612) 298-0721

16. Fred Scott & Sons
1444 W. Rand Road
Des Plaines, IL
U.S.A. 60016
Tel: (312) 297-1603

17. Gresham Driving Aids, Inc.
P.O. Box 405
30800 Wixom Road
Wixom, MI
U.S.A. 48096
Tel: (313) 624-1533

18. Handicaps Inc.
4335 S. Santa Fe Drive
Denver, CO
U.S.A. 80110
Tel: (303) 781-2062

19. Handi-Ramp Inc.
P.O. Box 745
1414 Armour Blvd.
Mundelein, IL
U.S.A. 60060
Tel: (312) 566-5861

20. Mobility Dynamics Inc.
21029 Itasca Avenue
Chatsworth, CA
U.S.A. 91311
Tel: (213) 998-1026

21. Para Industries (1978) Ltd.
74 Jamie Street
Nepean, Ontario
Canada K2E 6T6
Tel: (613) 226-5506

22. Rootes Maidstone Ltd.
Mill St.
Maidstone, Kent
England
Tel: Maidstone 53333

23. Saskatchewan Council for
Crippled Children & Adults
1410 Kilburn Avenue
Saskatoon, Sask.
Canada S7M 0J8
Tel: (306) 653-1694

24. Skillcraft Industries, Inc.
1270 Ogden Road
Venice, FL
U.S.A. 33595
Tel: (813) 488-1501

25. Target Industries Inc.
55 Newberry Road
Warehouse Point, CT
U.S.A. 06088
Tel: (203) 627-9329

26. Transi-Lift Equipment Corp.
#105 - 1120-53rd Ave. N.E.
Calgary, Alberta
Canada T2E 6N9
Tel: (403) 275-8801

27. Transportation Development
Centre
1000 Sherbrooke St. West
P.O. Box 549
Place de l'aviation
Montreal, Quebec
Canada H3A 2R3
Tel: (514) 283-4072

MANUFACTURERS/DEVELOPERS OF NON-CONVENTIONAL WHEELCHAIRS

1. A & B Electric Vehicles Ltd.
Belfont Trading Estate
Mucklow Hill
Halesowen, West Midlands,
England B62 8DR
Tel: 021 550 8118

2. Amigo Sales, Inc.
6693 Dixie Highway
Bridgeport, MI
U.S.A. 48722
Tel: (517) 777-0910

3. Arbeitszentrum für
Behinderte
CH - 4802 Strengelbach
Switzerland
Tel: 062/51 26 22

4. Batricar Ltd.
Griffin Mill
Thrupp, Stroud, Glos.
England GL5 2AZ
Tel: Brimscombe
(0453) 882243

5. The Braun Corp.
1014 South Monticello
Winamac, IN
U.S.A. 46996
Tel: (219) 946-6157

6. Maurice N. Brearley
Professor of Mathematics
University of Melbourne
Parkville, Victoria
Australia 3052

7. Brian Waite Enterprises
Lower Barn
Bodiam, East Sussex
England
Tel: Hawkhurst
(05805) 3535

8. Les Designers Douglas Ball Inc.
88 Ste Anne Street
Ste Anne de Bellevue, Quebec
Canada H9X 1L8
Tel: (514) 457-9861

9. E.F. Brewer Company
P.O. Box 159
Menomonee Falls, WI
U.S.A. 53051
Tel: (414) 251-9530

10. General Engines Co.
Electric Products Division
591 Mantua Blvd.
Sewell, N.J.
U.S.A. 08080
Tel: (609) 468-0270

11. D. Lyons
1880 Daniel
Drummondville-Sud, Quebec
Canada J2B 2A1
Tel: (819) 478-2289

12. Med-Ortho Design &
Manufacturing Ltd.
3206 Wharton Way
Mississauga, Ontario
Canada L4X 2C1
Tel: (416) 625-2605

13. Midon Engineering
Products Inc.
P.O. Box 1031
Kitchener, Ontario
Canada N2G 4E3
Tel: (519) 579-6147

14. Mobility Engineering and
Development Inc.
7131 Hayvenhurst Avenue
Van Nuys, CA
U.S.A. 91406
Tel: (213) 785-0958

15. Palmer Industries
P.O. Box 707 Union Station
Endicott, N.Y.
U.S.A. 13760
Tel: (607) 754-1954

16. E.M. Richison
Kinta, OK
U.S.A.

17. SAAB-SCANIA
Fack S-551 01
Jönköping, Sweden

SAAB-SCANIA
of America Inc.
Saab Drive
Orange, CT
U.S.A. 06477
Tel: (203) 795-5671

18. Sherry Products Inc.
1501 Pacific Coast Hwy.
Hermosa Beach, CA
U.S.A. 90254
Tel: (213) 379-8457

19. Tomco Enterprises Inc.
7701 Hoover Road
Valley Center, KS
U.S.A. 67147
Tel: (316) 755-2269

20. Travelectrix (Jersey) Ltd.
Route de la Haule
St. Brelade
Jersey, Channel Islands
U.K.
Tel: (0534) 25301

21. Tri-Aid Manufacturing
Co. Ltd.
63 James Watt Place
College Milton North
East Kilbride, Lanarkshire
Scotland G74 5HG
Tel: East Kilbride
(03552) 33133

22. Unicycle Inc.
2143 St. Patrick Street
Montreal, Quebec
Canada H3K 1B3
Tel: (514) 933-8993

23. Vessa Limited
Paper Mill Lane
Alton, Hants
England GU34 2PY
Tel: Alton (0420) 83294

24. Voyager Inc.
P.O. Box 1577
South Bend, IN
U.S.A. 46634
Tel: (219) 288-0511

25. Les White
50 Abraham Bay
Winnipeg, Manitoba
Canada R2P 1G1
Tel: (204) 633-6205

26. Wilgot Åhs Innovation AB
S-670 41 Koppom
Sweden

MANUFACTURERS/DEVELOPERS OF WHEELCHAIR LOADERS

1. Amigo Sales, Inc.
6693 Dixie Highway
Bridgeport, MI
U.S.A. 48722
Tel: (517) 777-0910

2. Anthony's Auto Wheelchair
Lift Co.
3293 South Seymour Road
Swartz Creek, MI
U.S.A. 48473
Tel: (313) 635-9698

3. ARCOA Industries
10761 - H Woodside Ave.
Santee, CA
U.S.A. 92071
Tel: (714) 449-6365

4. Chair Caddy Inc.
24 W. 7th Street
Tempe, AZ
U.S.A. 85281
Tel: (602) 968-1840

5. Chrysler Canada Ltd.
Chrysler Center
Windsor, Ontario
Canada N9A 4H6
Tel: (519) 252-3651

6. D.G. Hodge & Son Ltd.
15 Hurstdene Ave.,
Staines, Middlesex, England
Tel: Staines (81) 52981

7. Jean Lodes & Assoc.
1901 Ulmerton Road
Largo, FL
U.S.A. 33540
Tel: (813) 586-2122

8. Nelson Medical Products
5690 - F Sarah Ave.
Sarasota, FL
U.S.A. 33583
Tel: (813) 924-2058

9. Wheel-Chair Carrier Co.
P.O. Box 103
Waterville, OH
U.S.A. 43566
Tel: (419) 878-0015

10. The Wheelchair Carrier Corp.
3509 East Cannon Drive
P.O. Box 9328
Phoenix, AZ
U.S.A. 85068
Tel: (602) 996-6123

11. The Wheelchair Carrier
Sales Corp.
P.O. Box 16202
Phoenix, AZ
U.S.A. 85011
Tel: (602) 272-1788

APPENDIX B

MANUFACTURER/EQUIPMENT SUMMARY TABLE

MANUFACTURER/EQUIPMENT SUMMARY TABLE

MANUFACTURER/DEVELOPER	Wheelchair Lift	Wheelchair Securement	Non-Conventional Wheelchair	Wheelchair Loader
A & B Electric Vehicles Ltd.			X	
ABC Enterprises Inc.	X			
Advanced Mobility, Inc.		X		
Aeroquip Corp.		X		
American Golden Boy Sales Corp.	X			
American Seating Co.		X		
Amigo Sales, Inc.			X	X
Anthony's Auto Wheelchair Lift Co.				X
Apener Maschinenbau und Förderanlagen	X	X		
Arbeitszentrum für Behinderte			X	
ARCOA Industries				X
Batricar Ltd.			X	
Braun Corporation	X	X	X	
Brearley, Maurice N.			X	
Brian Waite Enterprises			X	
Bud Industries, Inc.		X		
Chair Caddy Inc.				X
Chas. Olsen & Sons		X		
Chrysler Canada Ltd.				X
C.N. Unwin Ltd.	X	X		
Coach & Car Equipment Corp.		X		
Coach & Equipment Manufacturing Corp.	X			
Collins Industries Inc.	X	X		
Creative Controls Inc.		X		
Crow River Industries, Inc.	X	X		
D.G Hodge & Sons Ltd.				X
Les Designers Douglas Ball Inc.		X	X	
Drive-Master Corporation	X	X		
Dynamic Mobilities Inc.		X		
E.F. Brewer Company			X	
Electro Van Lift Inc.	X	X		
Environmental Equipment Corp.	X			
Fred Scott & Sons	X	X		
General Engines Co.			X	
Gresham Driving Aids, Inc.		X		
Handicaps Inc.	X	X		
Handi-Ramp Inc.		X		
Jean Lodes & Assoc.				X

	Wheelchair Lift	Wheelchair Securement	Non-Conventional Wheelchair	Wheelchair Loader
Lift-U-Inc.	x			
Lyons, D.			x	
Mac's Lift Gate Corp.	x			
Mobility Dynamics Inc.	x	x		
Mobility Engineering & Development Inc.			x	
Nelson Medical Products				x
P & Q Lifts Inc.	x			
Palmer Industries			x	
Para Industries (1978) Ltd.	x	x		
Ratcliff Tail Lifts Ltd.	x			
Reb Manufacturing Inc.	x			
Richison, E.M.			x	
Ricon Sales, Inc.	x			
Rootes Maidstone Ltd.		x		
Saab-Scania			x	
Saskatchewan Council for Crippled Children & Adults		x		
Services Industriels Savaria Enr.	x			
Sherry Products, Inc.			x	
Skillcraft Industries, Inc.	x	x		
Target Industries Inc.	x	x		
Tomco Entreprises Inc.			x	
Total Mobility Systems & Designs, Inc.	x			
Transi-Lift Equipment Corp.	x	x		
Transportation Design & Technology, Inc.	x			
Transportation Development Centre		x	x	
Travelectrix (Jersey) Ltd.			x	
Tri-Aid Manufacturing Co. Ltd.			x	
Unicycle Inc.			x	
Vessa Ltd.			x	
Vapor Corporation	x			
Voyager Inc.			x	
Wheel-Chair Carrier Co.				x
Wheelchair Carrier Corp.				x
Wheelchair Carrier Sales Corp.				x
White, Les			x	
Wilgot Åhs Innovation AB			x	

GLOSSARY

Accessibility	- designates a transportation facility that has no barriers to prevent its use by all travellers.
Attendant	- refers to the person who assists the wheelchair user; in commercial transportation services, the attendant is usually the driver of the vehicle.
Chair	- wheelchair
Developer	- the individual, group or organization responsible for creating the device or product.
Indoor/outdoor	- designed primarily for indoor use but can also be used outdoors.
Non-conventional wheelchair	- a manual or powered vehicle, with innovative features, which differs from the standard powered wheelchair.
Outdoor/indoor	- designed primarily for outdoor use but can in some circumstances be used indoors.
Representative	- the person to contact for further product information.
Restraint belt assembly	- lap/torso belts, attached to the vehicle, that restrain the wheelchair occupant.
TDC	- Transportation Development Centre of Transport Canada
TSC	- Transportation Systems Center, U.S. Department of Transportation
Wheelchair driver	- a wheelchair user who, when driving a vehicle, remains in the wheelchair.

Wheelchair lift	- a device that raises and lowers a platform to accommodate the entry or exit of wheelchairs.
Wheelchair loader	- a device or mechanism that loads, stores and carries a wheelchair within or on a vehicle.
Wheelchair orientation	- the direction that a wheelchair and occupant face with respect to the direction of travel of the vehicle.
Wheelchair securement	- a device, or assembly of hardware, that secures a wheelchair within a moving vehicle and that may include a passenger restraint assembly.
User	- the wheelchair occupant
UMTA	- Urban Mass Transportation Administration, U.S. Department of Transportation
V.A.	- U.S. Veterans' Administration

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Challenge. Santa Ana, Calif., Challenge Publications.

Contact. London, England, The Royal Association for Disability and Rehabilitation.

Dialogue. Montreal, Quebec, Lethbridge Rehabilitation Centre.

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Image. Vancouver, B.C., Kinsmen Rehabilitation Foundation of British Columbia.

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Paraquad. Montréal, Québec, Association des paraplégiques du Québec.

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Rehabilitation Digest. Toronto, Ontario, Canadian Rehabilitation Council of the Disabled.

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Vanguard. Waterbury, Vt., Vanguard Inc.

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